DRUCKER WAKE-UP CALL

The "father of modern management" says IT managers need to get ready to drive information management. Page 51

EMERGING COMPANIES

A new section debuts on hot start-ups. This week: A service that tunes Web sites to maximize profits. Page 77

E-MAIL LOCKDOWN

QuickStudy: How digital wrappers can protect your e-mail and help prevent software piracy. Page 79

COMPUTERWORLD

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SHONNA VALESKA

"ACTIVE DIRECTORY, when it's in place, will be great," says Steve Sommer, CIO at law firm Hughes, Hubbard and Reed

UPGRADE DILEMMA

IF YOU WANT to get the most from Windows 2000 Pro on the server — such as the new global directory service — you'll have to upgrade all your desktop clients, too. Those cool new management tools just won't work on the thousands of Windows 95 and 98 machines you've already deployed. Is it worth it? Technology analyst Cynthia Morgan answers 10 key questions to help you decide.

Report starts on page 80.

WIN 2000 BETA 3 OFFERS LIMITED MIGRATION AID

Microsoft had pledged big fixes in Beta 3, now says it will wait for user feedback

BY SHARON GAUDIN

WINDOWS 2000

Two months ago, Microsoft said users would see significant improvements in the migration path from Windows 9x to Windows 2000 in the new operating system's third beta release. But interviews last week with company officials and top beta testers produced little evidence that has happened.

"Moving from Windows 98 isn't so bad — but don't even go there with Windows 95," said Jason Bruner, manager of network systems administration at Bellevue, Wash.-based VoiceStream Wireless, which has 218 Windows NT servers. He said he believes people will need third-party tools to ease the migration (see chart, page 97).

Bruner, who is part of Microsoft Corp.'s Rapid Deployment Program, said he has been impressed by Windows 2000. He said it appears to be about 45% faster than its NT 4.0 predecessor.

Late in February, Craig Beilinson, Microsoft product manager for Windows NT, conceded that there will be major problems migrating from Windows 9x to Windows 2000 [CW, Feb. 22].

"I think people will see a big difference in Beta 3," he said then, adding that Microsoft would take a two-pronged approach, working on improvements to existing utilities in Beta 2 and creating some completely new tools.

Last week, two beta testers — including another member of the Rapid Deployment Pro-

Windows 2000, page 97

ORACLE TO BOOST ERP APP SUPPORT

Users face wait of six months to a year

BY CRAIG STEDMAN
SAN DIEGO

Oracle Corp. is making big changes aimed at improving support for its ERP application customers. That support has been frustrating many users, who encounter problems such as long telephone hold times, inexperienced support workers and lengthy waits for bug fixes.

However, it may take six to 12 months for users to see major improvements.

More than a dozen users peppered Oracle executives with complaints about support during several sessions at last week's spring conference of the company's independent applications user group. Oracle acknowledged that the company's customer satisfaction surveys show its enterprise resource planning software support isn't meeting expectations.

Several users of the ERP applications said the problems often force companies to take matters into their own hands to get good support.

"You have to make the system work for you," said Scott Nasmyth, database administration manager for financial applications at Nike Inc. in Beaverton, Ore. For example, Nike sometimes puts off support calls until late afternoon

Oracle, page 97

Altered States

Changes being made to Oracle's applications support include:

- Continued hiring of telephone and on-site support workers
- Regional phone support groups to keep more calls local
- Letting users submit bug-fix requests via the Internet
- Addition of "customer advocates" to help users resolve problems

COMPAQ: IS DELL OR IBM THE MODEL?

PC maker ousts CEO, faces hard decisions

BY JAIKUMAR VIJAYAN AND STACY COLLETT

Attempts by ousted CEO Eckhard Pfeiffer to transform Compaq Computer Corp. from a mass-volume PC maker to an IBM-like provider of integrated information technology services will leave his successor to fight a battle on two fronts.

In the short term, Compaq needs to address its PC distribution conflicts, which have slowed down the company in the past year, according to users and analysts.

Longer term, the company must articulate an enterprise strategy that clearly explains how it plans to synchronize technologies it acquired from Digital Equipment Corp. and Tandem Computers Inc., ob-

Compaq, page 14

LOOK CLOSELY AT Y2K-READINESS

Varied metrics, sources show conflicting results

BY THOMAS HOFFMAN AND JULIA KING

A recent study of corporate year 2000 spending suggests that most U.S. power companies are lagging far behind in their projects. But another report from the electric utility industry congratulated power companies for being on track with their Y2K preparations.

So whom do you believe?

Savvy CIOs and other skeptics said companies should do their own detective work, asking probing questions of their

Y2K, page 16

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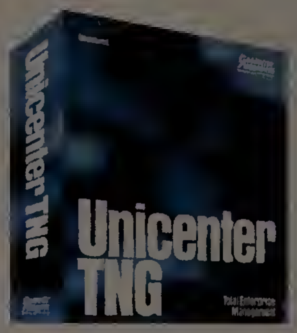

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WEB AD-VERSARIES

Mass media or low key? When it comes to promotion, Wholefoods.com and Mothernature.com take starkly different paths. Page 49 (Pictured left to right: Whole Foods' Dewayne Barry, Carl Morris and David Verba)

ANDREW YATES

FATAL ERRORS

Potentially lethal consulting mistakes and their impact and silver linings as told by three consultants. Page 58

SUSAN LEVAN

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80 **MULLING WIN 2K?** Take note: You'll have to upgrade client PCs to get the biggest benefits.

> "
>
> HERE WE ARE DROPPING BOMBS ON AN ENEMY 5,000 MILES AWAY, AND SOMEONE IN THE U.S. HAS FIGURED OUT A WAY TO TERRORIZE US WITHOUT FIRING A SHOT.
>
> REP. GIL GUTKNECHT (R-MINN.), ON "LESSONS LEARNED" FROM THE MELISSA VIRUS. SEE PAGE 25.

AT DEADLINE

Zander No. 2 at Sun

Sun Microsystems Inc. has made chief operating officer and hardware czar Edward J. Zander its president under CEO Scott McNealy. Zander, a 12-year Sun veteran, will oversee Sun's engineering, product development, sales and service. Zander rebuffed suggestions that his promotion was intended to stave off CEO offers from Hewlett-Packard Co. or others. "I have a really good job," he said.

Microsoft to Post Win 98, Explorer Fixes

Microsoft Corp. has identified three more year 2000 problems in Windows 98. The company said it will make software fixes part of the upcoming Windows 98 Second Edition and will post them at *http://windowsupdate.microsoft.com* in the next few weeks. Microsoft also posted a fix to three security holes in its Internet Explorer 4.0 and 5.0 Web browsers.

AT&T Bids $62B For MediaOne

AT&T Corp. Thursday offered $62 billion for cable company MediaOne Group in Englewood, Colo., in a bid to deliver voice, data and video services to MediaOne's 26 million residential customers. ComCast Corp. in Philadelphia last month bid $60 billion for MediaOne.

Feds: Airlines Need Y2K Insurance

The U.S. Department of Transportation has told U.S. and foreign airlines to carry full liability insurance to cover claims resulting from accidents blamed on year 2000-related system failures.

Y2K Bank Holiday

Most major banks and stock exchanges in Europe plan to shut down on Dec. 31 to avoid any year 2000-related problems. But laws in Finland and Denmark may prevent banks there from closing. The Federal Reserve Board vetoed a move to make Dec. 31 a U.S. trading holiday.

INTEL JUMPS INTO OUTSOURCING FRAY

New Internet services unit, partnerships to enable Web management, consulting services

BY BOB WALLACE

INTEL CORP. last week detailed plans to enter the lucrative business of hosting, managing, storing and delivering applications and Web content. The company is seeking to augment its revenue from the fiercely competitive chip and networking markets.

Although Web outsourcing is an increasingly crowded market, the Santa Clara, Calif.-based chip superpower is also banking on partnerships that could offer information technology managers more than a plain-vanilla infrastructure.

In addition to Web hosting and e-commerce operations, Intel will also provide consulting services.

For example, a few weeks ago, Intel and Excite Inc. teamed to develop a new e-commerce service to simplify Internet shopping for consumers and merchants.

Last year, Intel bought iCat Corp., which makes software that aids in the creation of secure, Web-based storefronts.

The vendor plans additional partnerships and acquisitions. Intel's new Internet Data Services division will build and operate a global network of data centers crammed with thousands of servers and costing up to $100 million each. Intel hasn't said how much it will invest in the effort or how it will price the services.

Still, one large user expressed interest. "Intel coming to the plate and offering space and servers for my applications is definitely a real nice play for both parties," said Sean Gilbert, information systems manager at credit-card transaction processor Card-Services International Inc. in Agoura Hills, Calif.

Guarded Optimism

One expert was cautiously optimistic about Intel's chances for success.

"Intel's certainly got the technology credentials, and they've proven the ability to market the hell out of themselves. But this area is very far afield from their core business," said Harry Fenik, an analyst at Zona Research Inc., a Redwood City, Calif., consultancy.

It's too soon to tell "if the Intel brand can bring the comfort and security needed to users for them to put their lives in Intel's hands," he said.

Although application outsourcing is an increasingly crowded market, Intel will face its toughest competition from well-established players that include IBM and MCI WorldCom Inc., Fenik added.

"We believe our experience building and maintaining factories worldwide is applicable, as well as our experience in capacity planning and forecasting, which will be critical to the success of the data centers," an Intel spokesman said.

Intel also has the option of drawing from a $3 billion capital budget.

Intel plans to build its first full production data center in the U.S. and expects it to go live by the end of this year. International data centers are planned for next year, the company said. ◗

Congress Leans Toward Web Privacy Laws

Shows little faith in industry self-regulation

BY PATRICK THIBODEAU
WASHINGTON

U.S. Sen. Orrin Hatch (R-Utah), chairman of the powerful Senate Judiciary Committee, last week warned businesses that some form of Internet privacy legislation "appears inevitable."

Hatch's prediction is based on two factors: growing support among legislators for online privacy protections, and a belief that industry self-regulation will ultimately fall short in stopping privacy abuses.

At a committee hearing last week, Hatch said he wants legislation that will establish a "limited and proper government oversight role" on Internet privacy issues, similar to the way the Securities and Exchange Commission oversees securities transactions.

Hatch hasn't offered up a bill, but his interest was viewed as "extremely significant" by privacy advocates like Marc Rotenberg, director of the Electronic Privacy Information Center in Washington. "The growing realization is that self-regulation has not succeeded," he said (see related story, page 6).

Sens. Conrad Burns (R-Mont.) and Ron Wyden (D-Ore.) recently introduced Internet privacy protection legislation. And in the House, Rep. Ed Markey (D-Mass.) is expected to reintroduce a bill, which failed last year, to establish privacy safeguards.

But industry groups said the legislative efforts are premature. Web sites — especially those most used by consumers — are adopting privacy policies in response to consumer demand, said Mark Uncapher, vice president of the Information Technology Association of America in Arlington, Va. "I think it reflects marketplace pressures," he said.

It's unclear whether the self-regulation argument will be helped or hurt by a forthcoming Federal Trade Commission study of Web site privacy practices. Last year, the FTC survey found that only 14% of all Web sites had privacy policies. If the FTC finds little progress in its new survey, it may also recommend privacy legislation. The study could be released in the next few weeks.

But even if the FTC finds substantial improvement, some lawmakers say privacy regulations will still be needed to go after so-called "bad actors" — Web site operators who reject self-regulation.

"By definition, a bad actor doesn't submit to self- or industry regulation," said Sen. Charles Schumer (D-N.Y.) at the hearing. ◗

AT A GLANCE

Lawmakers' Proposals

Sen. Orrin Hatch (R-Utah) may offer a bill that creates a privacy regulatory agency similar to the Securities and Exchange Commission

Sens. Conrad Burns (R-Mont.) and Ron Wyden (D-Ore.) introduced the Online Privacy Protection Act, which would require Web site privacy policies

Sen. Patrick Leahy (D-Vt.) has introduced an "E-Rights" bill that would protect users of online calendars or book buyers from government snooping

Rep. Ed Markey (D-Mass.) plans to reintroduce a Privacy Bill of Rights

Sen. Herb Kohl (D-Wis.) is considering legislation to create a Privacy Study Commission to review privacy issues

Corrections

An April 19 News story ["EDS Stays on Win 98 Path," page 1] incorrectly stated that Xerox Corp. has a lawsuit pending against Electronic Data Systems Corp. for nondelivery of certain services. It is EDS that has a lawsuit pending against Xerox for nonpayment for certain services, which EDS continues to provide to Xerox.

An April 12 News story ["E-Brokers' Snafus Provide Lessons," page 24] incorrectly stated that ETrade Group Inc.'s stock price fell by half after an online systems outage. The stock price decreased 9% on Feb. 5 after an outage on Feb. 4.

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OUTSOURCING ROUSES FIRMS TO MAKE SWITCH TO WEB EDI

Using Internet faster and cheaper than traditional EDI options

BY CAROL SLIWA

IN EIGHT YEARS, Cessna Aircraft Co. had managed to ramp up only 71 of its 4,000 suppliers to traditional electronic data interchange (EDI).

But the Wichita, Kan., manufacturer now has 1,300 suppliers — accounting for 95% of the company's purchase-order line items — performing electronic transactions.

Web-based EDI has been by far the most popular choice. Not only did the vast majority (an estimated 1,100) of Cessna's suppliers choose Web-based EDI — Internet forms that can be translated into an EDI format — but 50 of those original 71 EDI users have also switched to it, said Dave Oppenheim, a supply-chain manager at Cessna.

Getting more suppliers to do EDI helped cut information cycle time with suppliers by 50%, Oppenheim said.

What's more, "it was free for my trading partners," he said. "They didn't have to buy any software; they didn't need the IS department. It was developed for them on our behalf. And it's also simple."

Web EDI has been slower to catch on than experts predicted, analysts and industry observers said (see chart). But companies that have elected to outsource have been able to quickly ramp up large numbers of suppliers to it because Web EDI avoids traditional EDI's cost and complexity. For example:

- The Boeing Co.'s rocket-engine division in Canoga Park, Calif., moved 371 suppliers — 315 of them through the Web — to electronic transactions, after getting only 35 onboard in the past. Similarly, Boeing's Mesa, Ariz., aircraft and missile systems division got about 1,300 suppliers onboard, including 1,100 through the Web, said Kim Carrell, a Boeing project manager.
- The Sherwin Williams Co., a paint maker in Cleveland, ramped up 150 suppliers to traditional EDI in about 18 months with help from its value-added network, Sterling Commerce Inc. in Dublin, Ohio. Sherwin-Williams now plans to hire a service provider to get another 2,000 suppliers onboard via Web EDI.

JUST THE FACTS

Slowpoke

Why Web EDI has been slow to catch on:

- **First- and second-generation Web forms aren't as easy to use as expected**
- **Products don't provide easy integration with back-end systems of both trading partners**
- **Large companies with significant investments in traditional EDI have been reluctant to move in the Internet direction**
- **Lack of in-house expertise**

SOURCE: VARIOUS ANALYSTS

The average company typically has been able to ramp up only 10% to 20% of its trading partners to traditional EDI, said Carol Rozwell, an analyst at Gartner Group Inc. in Stamford, Conn.

Rozwell said the Web offers companies three options:

- Buy Web-form software and do the work themselves.
- Hire a service provider to set up mutually acceptable formats for trading partners and perform any necessary data-conversion work.
- Build an extranet in which documents and other information can be exchanged and accessed.

Of those three, Rozwell predicted that the increasing trend toward service-provider outsourcing will outpace the others "because so many organizations have resource constraints right now."

Both Cessna and Boeing outsourced their work to San Diego-based ESIS Inc. Cessna's Oppenheim said he pays ESIS a per-supplier fee that amounts to less than an average monthly cable TV bill.

At Boeing, the notion that ESIS "could set up a supplier and bring them online in about 15 minutes, compared [with] three months [in-house], was very attractive," Carrell said.

Outsourcing let Cessna redeploy staffers to other work, Oppenheim said. And at Sherwin Williams, "we don't have the resources to build a Web-based program or the expertise in it," said Edward Thompson, director of merchandise control.

When he checked out the option two years ago, Thompson said, the expense would have been "unbelievable." Now it's much cheaper, he said. ▶

CIH Virus Set To Strike Today

BY ANN HARRISON

Users are being told to be on guard against CIH, a computer virus that attacks hardware and is set to go off today. The virus, first identified last year, is a Windows executable file that remains dormant on a machine until it delivers its payload.

But Roger Thompson, technical director of malicious code research at the International Computer Security Association in Reston, Va., said the CIH virus had the potential to be a disaster until the Melissa virus came along.

"CIH came out last June and was difficult to detect," he said. "But when Melissa happened, almost everyone updated their virus detection tools, which [also] protect them from CIH."

The virus overwrites the first megabyte of each hard disk and attacks a PC's BIOS, which helps the machine boot. Many antivirus programs have been updated to defend against it.

A spokesman at Sophos Inc., an antivirus software vendor in Woburn, Mass., said infected computers must have their BIOS chip replaced. The company recommends that users set their antivirus software to block the virus, not just eliminate it. Both Sophos *(www.sophos.com)* and Network Associates Inc. *(www.nai.com)* are offering free, anti-CIH software. ▶

U.S./EU Privacy Standards Draft Not EU-Compliant

Pundits charge U.S. businesses unwilling to 'accept sufficient level of accountability'

BY ANN HARRISON

A draft set of guidelines released last week that seeks to bridge privacy differences between the U.S. and the European Union (EU) don't comply with EU privacy standards, a privacy expert said.

Joel Reidenberg, a professor at Fordham Law School in New York who conducts privacy studies for the European Commission, said the guidelines developed by a joint, U.S./EU panel don't adequately address privacy enforcement and consumer access to data.

"I am skeptical it can happen because the American side doesn't seem to be willing to accept a sufficient level of accountability," Reidenberg said. He said that even if the guidelines were accepted, U.S. companies would still be subject to privacy policies in each of the 15 EU member nations that can interpret EU directives.

The EU Directive on Data Protection, which took effect last year, permits EU members to block the flow of personal information about their citizens to countries that don't offer adequate data protection. That would prevent e-commerce companies based in the U.S. from gathering consumer data, which is often part of online transactions.

Because U.S. companies prefer self-regulation, the U.S. Commerce Department has been negotiating with the EU to create a "safe harbor" that will give U.S. companies an acceptable level of compliance with the directive. The draft guidelines say organizations must do the following:

- Inform individuals that personal information is being collected.
- Inform them whom the data will be shared with and guard against unauthorized disclosure.
- Explain how they can limit that data's use and disclosure.

The Commerce Department said it hopes to reach a final agreement with the European Commission on safe harbor guidelines by the time of the U.S./EU Summit on June 21.

The plan gives organizations the power to decide what constitutes "reasonable" access to consumer data. But Reidenberg said he doubts the U.S. will pass laws that give EU nations the unfettered access they expect or will enforce legal sanctions for privacy violations set by EU privacy commissions.

Chet Dalzell, a spokesman for the New York-based Direct Marketing Association, said a distinction is needed between regulating access to sensitive medical information and consumer data.

Dalzell said the EU won't dictate U.S. privacy policies, which are already enforced by the Federal Trade Commission. U.S. companies will likely make decisions on where they want to do business based on countries' data policies, he added. ▶

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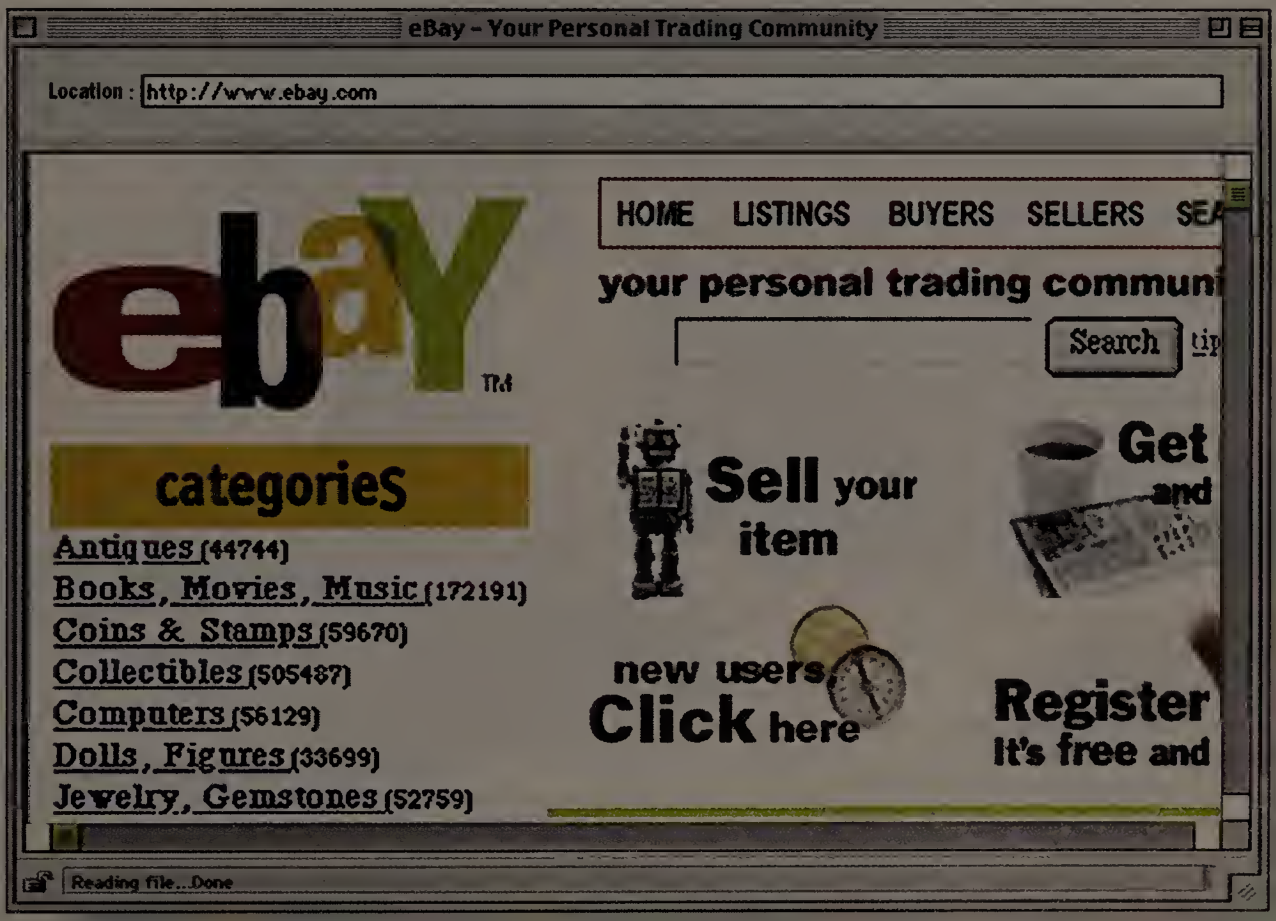

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BRIEFS

Microsoft Ups Support

Microsoft Corp. this week plans to announce customer-support programs designed to address large corporate IT shops that say the vendor isn't up to supporting mission-critical applications [CW, March 22]. Microsoft is expected to add more technicians to its call center and send more support staff to help users in person.

Broker Theft Charged

In the first case of its kind, the Federal Trade Commission (FTC) last week charged an information broker, Touch Tone Information Inc. in Denver, with illegally obtaining consumers' private financial information by impersonating account holders. The FTC said information obtained using such "pretexting" services is frequently sold on the Internet.

Y2K Suit Proceeds

A Contra Costa, Calif., Superior Court last week gave the go-ahead to a lawsuit targeting computer retailers such as Circuit City Stores Inc. for allegedly failing to disclose year 2000 readiness information about the products they sell.

Profits Increase

Among those posting results last week (see more, page 29), Sybase Inc. said a winter restructuring bore fruit for its first quarter this year, with a $5.9 million profit on $208 million in revenue. It lost $81 million in the same quarter last year.

Informix Corp. earned $196.6 million, compared with $161 million a year ago. Gateway net income rose 31%, to $99.6 million on sales of $2.1 billion.

Short Takes

COMPUTER SCIENCES CORP. (CSC) has purchased the IT assets of **ENRON CORP.**'s Enron Energy Services. The deal lands CSC in the business of reading meters and collecting utility payments. . . . **RED HAT SOFTWARE INC.** has announced it will release Version 6.0 of its Linux operating system variant on May 10.

Shared Risk/Reward Pact Is a Y2K Rarity

AlliedSignal takes cue from outsource deals

BY THOMAS HOFFMAN

A division of AlliedSignal Inc. has benefited from an unusual year 2000 contract that let it split part of the cost savings with the contractor it hired.

AlliedSignal Aerospace Equipment Systems' (AES) shared risk/reward deal with Ernst & Young LLP takes a page from similarly constructed outsourcing contracts, where such deals have become commonplace. But there have been few of those arrangements in Y2K circles.

Cap Gemini America LLC in New York struck a few similar deals with some of the first clients it did year 2000 renovation work for, said Noah Ross, vice president of the firm's application renovation center in Tarrytown, N.Y. Although he said the deals were successful, he said they have been the exception rather than the rule.

Other Deals

"I doubt there were many deals struck like this before," said Bill Ulrich, president of Tactical Strategy Group Inc., a Soquel, Calif.-based consultancy. But Ulrich warned that one of the potential problems with such a deal is that a vendor that stands to profit by meeting certain deadlines and cost targets might be inclined to skimp on testing.

Still, there have been some successful shared risk/reward IT outsourcing agreements, including Andersen Consulting's contract to build a child welfare reimbursement system for the Massachusetts Department of Social Services. Chicago-based Andersen agreed to receive payment only after the state began to receive federal child welfare reimbursements.

Tempe, Ariz.-based AES hired Ernst & Young in late March 1998 to renovate thousands of financial and manufacturing systems that had been written in Cobol and more obscure mainframe languages such as CA-Easytrieve from Computer Associates International Inc. Having already conducted a full inventory assessment of AES's application portfolio under a separate contract, Ernst & Young then proceeded to break down the renovation project into 11 "clusters" of 600 to 1,200 programs per cluster.

Though the two companies agreed that Ernst & Young had to meet specific milestones in fixing those clusters, the contract itself was centered on meeting a Dec. 31, 1998, deadline at a targeted cost. The consultant "made or beat every milestone set for the project," said Gary Cantrell, director of information systems projects at AES, a $2.8 billion AlliedSignal business unit that makes aerospace hardware such as aircraft landing systems.

Cantrell said both companies originally estimated that the total project costs could swell an additional 20% to handle unknowns, such as having to expand program date fields where a cheaper, less time-consuming approach of "windowing" older IBM IMS database applications couldn't be done for technical reasons.

But by relying on its inventory assessment, Ernst & Young was able to determine how many applications had to be expanded and how many programmers the companies need. The due diligence "saved us a ton of time and money," Cantrell said. ◗

AT A GLANCE

Y2K Outsourcing

Who: AlliedSignal Aerospace Equipment Systems in Tempe, Ariz.

What: Struck a shared risk/reward contract with Ernst & Young to renovate thousands of mainframe software programs. Under the contract, both companies would share the cost of project overruns or cost savings that resulted

When: Mainframe application renovation project lasted from late March 1998 to December 1998

Result: The project was completed on time and 8% under budget, despite 5% to 6% growth in out-of-scope costs. AlliedSignal shared some of the savings with Ernst & Young and is planning to apply this model to future IT projects

WAL-MART'S Y2K BILL UP BUT STILL A BARGAIN

Updated IT helps big retailer contain costs

BY DAVID ORENSTEIN

WAL-MART Stores Inc. will spend more than twice as much as it previously expected to solve year 2000 problems and is seeing some deadlines slip. But at $27 million, the new Y2K tab for the nation's largest retailer is still only a fraction of any of its major competitors'.

It will spend another $19 million this year to test its converted systems and replace noncompliant hardware. In previous reports, Wal-Mart had said its spending would total $12 million. Spokeswoman Jessica Moser declined to explain how the company's estimated expenses have more than doubled.

But recent statements from other retailers show their spending is much higher, ranging from $46 million to $75 million (see chart). Several analysts said Wal-Mart's newer systems are keeping its Y2K costs lower than even its largest competitors, which are a fraction of its size.

Y2K at a Discount

Wal-Mart is reporting much lower year 2000 expenses than its biggest competitors:

RETAILER	TOTAL EXPENSES	LATEST REPORT
Wal-Mart	$27M	April 1999
Dayton Hudson	$52M	April 1999
J. C. Penney	$46M	December 1998
Kmart	$75M	April 1999
Sears	$65M	March 1999

SOURCE: LATEST FILINGS WITH THE SECURITIES AND EXCHANGE COMMISSION, WASHINGTON

In its annual shareholders report filed last week with the Securities and Exchange Commission, $137.6 billion Wal-Mart said it had spent only $8 million on year 2000 by the end of January.

Rather than heightened efficiency, however, Wal-Mart's year 2000 bill might really be a product of the unclear reporting requirements the SEC has imposed on companies, said Cathy Hotka, vice president of IT at the National Retail Federation (NRF) in Washington.

The NRF is a trade association that includes virtually all the major retailers except Wal-Mart.

Wide disparities in Y2K spending among airlines, for example, have been chalked up to reporting differences rather than major differences in IT sophistication [CW, Feb. 22].

Wal-Mart reported that all its internal systems have been converted and that its critical systems have been tested. A second round of testing began last month, and a third is planned for October.

But tests with business partners and suppliers will be completed in October instead of July, as Wal-Mart previously reported. The company's formation of a contingency plan was also delayed to October.

But analysts gave Wal-Mart credit for its in-house efforts and business-to-business links. "Wal-Mart is ahead in implementing [new] systems to optimize a whole range of critical retail business processes. [It] hasn't been penny-wise and dollar-foolish," said Greg Girard, an analyst at AMR Research Inc. in Boston. ◗

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The solution is in sight.

Whirlpool Plans to Spin R/3 for Call Center

BY CRAIG STEDMAN
SAN FRANCISCO

Late this year, Whirlpool Corp. plans to turn on SAP R/3 and link it to the Internet so retailers can place and track orders online.

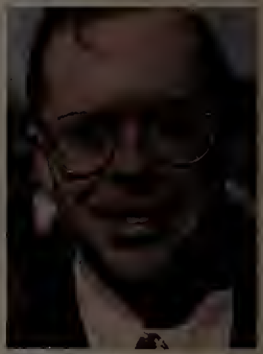
But that doesn't mean the call-center workers who take orders over the phone will go away. In fact, their jobs will become more important — and more complex, said senior project manager Bob Briggs.

At a conference held by Boston-based AMR Research Inc. last week, Briggs said Whirlpool plans to use SAP AG's R/3 applications to give call-center employees access to all the information they need to answer questions about pricing, promotions and billing from retailers that sell its appliances.

That data currently is split into stand-alone mainframe systems, forcing retailers to get answers from multiple departments, Briggs said.

Whirlpool isn't the only company that's changing — but still depending on — its call center while moving more routine business transactions to the Web.

FDX Corp., the Memphis-based parent company of package delivery giant Federal Express, is working to integrate its high-profile customer extranet and its call center after combining them under one executive. "We don't see them as two separate issues," said FDX CIO Dennis Jones, who also spoke at the AMR conference.


FDX'S JONES: Extranet and call centers fall under one roof

The growth of FDX's call-center workforce is "relatively stagnant" now that customers can use the Internet to do things such as track packages by themselves, Jones said.

Technology Key

But the call center is still vital "because the most complex problems are going to go there," he added. "The nature of the work has changed, but I think its importance goes up."

Ovum Inc., a U.K.-based consulting firm, last week released a report predicting that call centers will remain central to business strategies because they have "a crucial advantage" over e-commerce Web sites.

But change won't be easy. At Benton Harbor, Mich.-based Whirlpool, for example, call-center workers will be fielding "bigger and more sophisticated questions" on matters such as credit and pricing promotions, Briggs said.

That will require them to learn both R/3 and a new set of business processes before the combination of SAP's software and Whirlpool's retailer extranet goes into use in the fourth quarter, Briggs added. ▶

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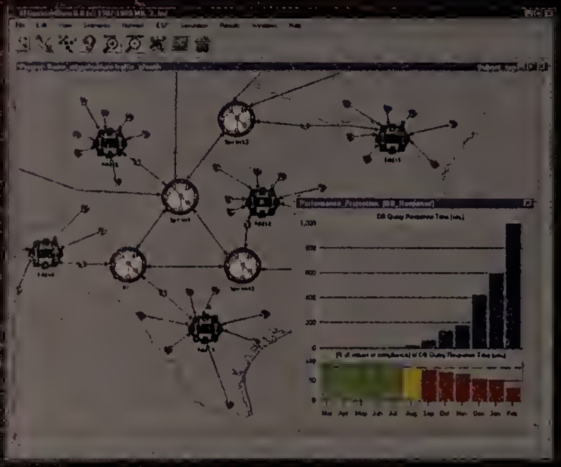

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IT EXECS 'DAUNTED' BY MOBILE OPTIONS

With so many protocols and operating systems, they fear choosing wrong horse

BY MATT HAMBLEN
CHICAGO

MOBILE computing vendors gathered here last week announced more options for remote workers. But information technology managers and analysts described the array of devices, operating systems and wireless protocols as confusing — and even "daunting."

IT managers said they welcome choices but worry about getting stuck supporting an operating system or protocol that won't last in the market.

"It's definitely daunting having to make choices in the current environment," said Jim Vannette, chairman of Holland Special Delivery, a delivery service in Holland, Mich., that's developing a mobile automation system for its drivers. "There's such a staggering array of options without standards."

"I'd call the situation chaotic," said Opie D. Lindsay, business development manager at Columbia Gas of Virginia in Richmond. Lindsay is considering handheld technology for service personnel but is worried about choosing technology without staying power.

Lindsay joined other users at the Mobile & PDA (personal digital assistant) Expo here, where analysts debated whether Microsoft Corp.'s Windows CE operating system or the Palm Computing platform will dominate in North America, while facing pressure from the EPOC32 operating system in Europe. There are about 3 million PalmPilots from 3Com Computing Corp. in use in the U.S., with another 1 million CE devices — from handhelds to clamshells to mini-laptops — running the latest Windows CE version, dubbed Jupiter.

There was no consensus on which will take the lead, although many analysts and some users feel Microsoft better recognizes the need to connect mobile computers to corporate databases, e-mail and the Internet.

Mark Desautels, managing director of the Wireless Data Forum in Washington, introduced a panel of vendors deploying wireless communications protocols. The variety of choices "certainly has been an obstacle to customer usage," he said, but some companies are now learning that they can increase productivity with wireless technology.

Some vendors seem to be willing to produce machines in any form or with any operating system in hopes of finding one that sticks, analysts said. For example, IBM previewed a Windows CE Jupiter mini-laptop in its WorkPad line. The WorkPad used to be just a handheld running the Palm operating system. ◗

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Microsoft to Scrutinize Netscape/AOL Pact

Seeks data to bolster antitrust defense

BY PATRICK THIBODEAU
WASHINGTON

Microsoft Corp. has more to gain than lose in its efforts to learn the secrets of America Online Inc.'s $4.2 billion stock deal to acquire Netscape Communications Corp., legal experts said.

Microsoft lawyers begin taking depositions this week from executives involved in the deal as part of an effort to torpedo the government's antitrust case against the software giant.

Microsoft will gain if documents show that it hasn't stifled competition. Because Microsoft requested the deposition, and already obtained documents through discovery, experts said they suspect the company can make its points.

But if it doesn't have the documents, and the witnesses effectively argue that Netscape had no choice but to merge, Microsoft's stand might be in peril. "There has to be documentary foundation" for Microsoft's position, said Hillard Sterling, an attorney at Gordon & Glickson PC in Chicago.

Microsoft will depose Peter Currie, the former chief financial officer at Netscape, in Washington on Wednesday. Michael Popov, a vice president at Sun Microsystems Inc. in San Francisco, will be deposed on Friday. Sun is a part of the AOL/Netscape deal, having agreed to acquire some Netscape technology. Microsoft is expected to later depose AOL CEO Steve Case.

Microsoft will likely attempt to get the parties to acknowledge that the "merger creates a powerful platform for competing against Microsoft," said William Kovacic, a visiting professor at George Washington University Law School in Washington. ◗

HP Lends Credibility to Linux

Users welcome support, but shrug off impact

BY DAVID ORENSTEIN

Hewlett-Packard Co.'s pledge last week that it, too, will offer comprehensive support for Linux users bolstered Linux's credibility but might not be enough to encourage any major shifts toward the free variant of Unix, users said.

HP said it will support companies that use any major version of Linux on HP or even other computers. The company said HP engineers will provide service around the clock with a guaranteed response time as low as two hours.

In the past two months, IBM has announced global support for multiple Linux versions, and San Francisco-based LinuxCare Inc. has begun providing support for some Dell Computer Corp. computers running Linux.

Mountain View, Calif.-based SGI is also expected to weigh in soon with a support announcement.

At the start of the year, major vendors had no specific plans to support Linux, but now there's strong competition, said analyst Stacy Quandt at Giga Information Group in Cambridge, Mass. "The stakes are definitely increasing," Quandt said.

As a result, users are taking Linux more seriously but not feeling driven to adopt it. "It has to be driven by a need," said Kevin Bell, information technology director at Foster Wheeler Energy International Inc. in Clinton, N.J. "At the moment, there isn't a need."

But Bell said that if a vendor such as Dell or HP presented him with the option of Linux or Windows the next time he needed servers, he might take a closer look at Linux.

At the avionics division of The B.F. Goodrich Co. in Grand Rapids, Mich., where systems administrator Tom Stoddard runs a Linux workstation, he has never suggested that the company swap Linux for HP-UX on its data servers. Even with HP's full support, Stoddard said, the storage and other hardware on a high-end server may prove too complicated to be easily supported in Linux. ◗

Data Visualization Tools: Cool, Yes, But ROI Questioned

BY STEWART DECK

More software packages for visualizing and interacting with data in 3-D patterns are coming on the market, but measuring the user benefits of the razzle-dazzle graphics is still difficult.

Cognos Inc. and Visual Insights, a spin-off of Lucent Technologies Inc., are readying Cognos Visualizer and Visual Insights Advizor, respectively. The visualization tools will let users dip into large data stores and both see and interact with their reports as 3-D graphs and tables instead of rows and columns.

Ottawa-based Cognos will release its product this week, and Visual Insights, in Naperville, Ill., will deliver its product May 6. Other makers of visualization tools include IBM, Visible Decisions Inc. in Toronto and Decisionism Inc. in Boulder, Colo.

Visualization tools can be useful in three areas, said beta tester Michael Embry, lead analyst for data warehousing at retailer AutoZone Inc. in Memphis. "They can help extend statistical analysis, extend graphical presentation tools and be used as analytical applications by themselves," Embry said. "Whether they're as useful as they look is a good question."

Two trends are driving this growing market: the desire to put more report-generating capabilities into the hands of end users and the more advanced graphics-handling capabilities of new PCs.

Visualization technology is "looking for a good home," said analyst Philip Russom at Hurwitz Group Inc. in Framingham, Mass. "We've seen it in data mining, and now we're starting to see it in visualizing multidimensional [online analytical processing] data." ◗

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BRIEFS

Sun to Debut HotSpot

At this week's Java Enterprise Solutions Symposium '99 in Paris, Sun Microsystems Inc. plans to launch its Java performance-boosting HotSpot Java virtual machine [CW, April 19] and name licensees for the for-fee technology. Java ally IBM – which recently released a Java virtual machine of its own for Windows – already has stated that it has no plans to license the technology. Although Hewlett-Packard Co. has seen performance improvements of 20% to 40%, HotSpot isn't the "big bang" that will solve all problems, said Susan Henson, HP's Java program manager.

Decency Act Affirmed

The U.S. Supreme Court last week affirmed a decision by a three-judge panel in California to narrowly uphold a section of the 1996 Communications Decency Act contested by Apollomedia Corp. The firm filed a lawsuit in January seeking to block enforcement of a section of the act, claiming that it violated First Amendment rights. The panel upheld the law by interpreting it narrowly to apply only to obscene material not protected by the First Amendment.

Europe Moves on E-Commerce Laws

In reviewing a proposed law that would set a single standard for European e-commerce liability, a European Parliament committee has rejected moves to ban spam and raise the liability of network operators who transmit illegal works. Separately, Europe's telecommunications ministers agreed all European Union members should pass laws that recognize digital signatures as equal to handwritten ones.

Short Takes

THE WILLIAMS COS., the nation's largest transporter of natural gas, has awarded a $20 million outsourcing contract to KEANE INC. . . . SYBASE INC. has released Version 3 of its PowerJ Java tool, Version 7 of PowerBuilder and Version 3 of its application server. . . . INPRISE CORP. said Version 3 of its JBuilder Java tool will ship next month.

Continued from page 1

Compaq Must Decide: Model Itself on Dell or IBM?

servers said.

Pfeiffer's abrupt ouster — which leaves Chairman Ben Rosen temporarily in charge of the $31 billion behemoth — coincided with the announcement of a disappointing quarter for the company. Compaq last week announced profits of $281 million on revenue of $9.4 billion — both figures well below analyst expectations.

Channel Issues

Most of the company's immediate problems stem from its struggle to move to a distribution model capable of competing with low-cost direct marketers like Dell Computer Corp., said Jonathan Eunice, an analyst at Illuminata Inc., a consultancy in Nashua, N.H.

Compaq's build-to-order attempts so far have been halfhearted because of fears that it would antagonize channel partners, which account for a major portion of Compaq's sales. Overly optimistic market forecasts early last year also led to a major inventory glut that took the company all of last year to work through.

The overall result has been higher system costs compared with direct-sales rivals, said Dave Krauthamer, IT director at Advanced Fibre Communications Inc., a manufacturer of telecommunications equipment in Petaluma, Calif., that uses more than 1,500 Compaq PCs. "When you are locked into a channel strategy, shifting away from that can be very painful," Krauthamer said.

Some argued for a bold yet painful move: "Strategy is [about] making hard choices. If they made a decision to sell direct, they should acknowledge [the backlash from the channel] and keep going," said Rashi Glazer, co-director of the Center for Marketing Technology at the University of California at Berkeley.

Then there's the long view. Compaq has been talking about how it will integrate pieces of its acquired technologies to build robust servers using commodity components, but it hasn't delivered a product featuring advanced technologies like clustering and partitioning. "I have no idea as to what their strategy is to integrate the product lines or how one might complement the other," said Dennis Harvat, manager of IT assessment at The Gillette Co. in Boston. "If they plan to integrate Alpha technology into their [PC] server line, it would be nice to know this."

Partners Play Middlemen

Although both Digital and Tandem were expected to seriously boost Compaq's service capabilities, not much of that has been evident at the user level, said Compaq user Paul Tinnirello, vice president of information systems at A. M. Best Co., an insurance rating firm in Oldwick, N.J.

"They really need to get closer to their customers instead of always putting a [partner] in front of them," Tinnirello said.

That lack of direct communication by Compaq is of particular concern when it comes to issues regarding acquired technologies like Digital's VAX and VMS, said Bill Sherwood, a systems analyst at steelmaker NuCor Corp. in Charlotte, N.C.

"I have heard practically zero from Compaq as far as getting hold of me and making me feel better about VAX/VMS," Sherwood said.

The incomplete integration of the Digital, Tandem and Compaq sales forces has led to multiple contact points for customers, said Ashok Kumar, an analyst at Piper Jaffray Inc., a Minneapolis-based securities broker. Compaq needs to present a single contact point for customers and show direct accountability for its technology, Kumar said.

Although attendees at Compaq's recent Innovate user show voiced support, others in a *Computerworld* survey showed confidence sagging in Compaq's ability to make the most of its Digital and Tandem deals [CW, April 19]. ▶

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> [We want someone who can manage a] company that is growing and complex.
>
> **BEN ROSEN, CHAIRMAN, COMPAQ COMPUTER**

MORE THIS ISSUE

For information on the impact on Compaq's channels in Europe, **see page 20.**

Pfeiffer's Ouster a Surprise

Did Compaq CEO get the bum's rush?

BY JAIKUMAR VIJAYAN

Last week's ouster of Compaq Computer Corp. CEO Eckhard Pfeiffer surprised users and analysts. Though slowing revenue and falling margins have been putting a lot of pressure on Pfeiffer recently, most thought he would be given more time to turn the situation around.

Despite its financial slowdown, "Compaq has good products, they sell well, they are a credible company. . . . I was very surprised that they let Pfeiffer go," said Dave Krauthamer, information technology director at Advanced Fibre Communications Inc. in Petaluma, Calif.

Following his exit from the company, Pfeiffer lashed out at the Compaq board of directors in an interview with CNN last week. He claimed that he had been made a "scapegoat" to appease an increasingly jittery Wall Street.

"He does have some valid points," said Ashok Kumar, an analyst at Piper Jaffray Inc. in Minneapolis.

"You can't have a board that takes a completely hands-off approach for multiple quarters and then suddenly intervenes" like this, he said. "You need to have a constant dialogue" when there are problems.

Huge Growth

Pfeiffer's exit ended eight years at the helm of Compaq — he joined the company in 1983 — during which he transformed it from a $3 billion PC maker to a $31 billion vendor of enterprise technologies and services.

Much of Compaq's early market gains under Pfeiffer were a result of very aggressive PC price cuts. The company's more recent strategy — acquiring its way to the $50 billion revenue target by 2000 — may have been the beginning of the end for Pfeiffer, users and analysts said. ▶

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> [Feedback] from other people is that the Compaq board should hang their heads in shame.
>
> **ECKHARD PFEIFFER, FORMER COMPAQ CEO, IN A CNN INTERVIEW**

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Show Targets Warehousing Integration

Conference to tackle system headaches

BY STEWART DECK

The maturity of the data warehousing market, warehousing in health care and ways to integrate the many products on the market look to be the hot topics at this week's Data Warehousing Institute's Spring Implementation conference in Atlanta.

More than 500 attendees plus exhibitors are expected.

IT shops have reached the level "where we don't have to fight to build data warehouses any more. But don't confuse acceptance with maturity," said Richard Rist, vice president of education and research at the Data Warehousing Institute, a for-profit educational group in Gaithersburg, Md.

One reason is that product integration still has a long way to go. Many users who figured they could build a best-of-breed warehousing system with a collection of best products have discovered this integration headache.

Microsoft No Cure-All

Michael Schiff, an analyst at Current Analysis Inc. in Sterling, Va., said many users thought Microsoft Corp.'s entry into the warehousing arena last year with SQLServer 7 and metadata and repository developments would take care of many integration issues. "But Microsoft still has years to go before it achieves true integration," Schiff said.

Warehousing in health care will be a central part of this conference because data warehousing is "huge" in managed care environments, Rist said. "It's one of the few ways they can look at financial trends [and] see which [medical] treatments have an effect on their bottom line.

"Leading companies have already built warehouses and now it's moving down to suppliers and trickling into the physician side," he said. ◗

Cutting Through the Numbers

STUDY CONDUCTED BY	INDUSTRY COVERED	WHEN	METHODOLOGY	CONCLUSIONS
Triaxsys Research LLC, Missoula, Mont.	Cross-industry	December 1998	Analyzed companies' Y2K disclosure statements sent to the SEC, comparing total estimated Y2K budgets with Y2K-related expenditures through December 1998.	Figures are now several months old, which is an eternity in Y2K countdown terms. Spending gaps may also reflect that initial Y2K budgets were inflated.
Cap Gemini America LLC, New York; and Rubin Systems, Inc., Pound Ridge, N.Y.	12 vertical industries plus federal, state and local government agencies	December 1998	Quarterly survey of IT directors and managers of 110 large U.S. corporations and 12 federal, state and local government agencies.	The ongoing study, launched in 1997, has been useful in tracking increased occurrences of year 2000-related failures and progress. But Cap Gemini decided to stop publishing vertical industry statistics after December 1998.
Gartner Group Inc., Stamford, Conn.	Cross-section of vertical industries	March 22, 1999	Telephone interviews and surveys with executives at 15,000 companies in 87 countries, updated every three months.	Gartner's research is exhaustive, but it is unclear how or if it validates user responses
North American Electric Reliability Council (NERC), Princeton, N.J.	Electricity generation and distribution	January 1999	Individual companies filed self-conducted assessments of their Y2K readiness with NERC. NERC reports findings on a quarterly basis but makes intermittent updates continually (*www.nerc.com*). Next quarterly report due April 30.	Low level of confidence in self-assessments.

Continued from page 1

Look Closely at Y2K Readiness

business partners and utilities instead of relying on outside studies.

They said surveys of corporate executives and studies of data sent to the Securities and Exchange Commission don't paint a realistic picture of an industry's year 2000-readiness. That's especially true when the study's underlying data is several months old, which is an eternity for a Y2K project (see chart above).

Constant Changes

A company's year 2000 status "is changing almost daily," said Jon Arnold, CIO at Edison Electric Institute, a Washington-based trade association for electric utilities. "If you're working off of information older than 30 days, you're out of date."

A case in point: Triaxsys Research LLC in Missoula, Mont., recently published an analysis of SEC filings made by 211 Fortune 1,000 companies as of Dec. 31. The report said telecommunications companies had spent only 32% of their total year 2000 budget and utilities only 48%. But many of those SEC reports were actually put together in October.

Furthermore, many companies that set a Dec. 31, 1998, deadline to complete their software renovations didn't update their SEC disclosures until mid-January or later. Those updates weren't reflected in the Triaxsys research.

"We never stated [the data] was current as of today," said William Ulrich, a partner at Triaxsys and *Computerworld* columnist.

But he argued that "people need to use their brains" and draw their own conclusions about companies that have worked on the year 2000 problem for three years and were only halfway done with one year left.

Critics also questioned the validity of industry self-assessments, such as surveys by trade associations and the quarterly reports of the North American Electric Reliability Council.

To be credible, the utility industry's reports must be validated independently, said Paul A. Strassmann, a former CIO at Xerox Corp. and the U.S. Department of Defense and a *Computerworld* columnist.

The utility industry acknowledges that self-assessment has been a weakness in gauging Y2K-readiness and is exploring whether to add validation requirements to the industrywide survey, Arnold said.

To get a more accurate picture of suppliers' Y2K status, several CIOs suggested conducting in-depth interviews with suppliers to scrutinize every aspect of their year 2000 readiness and contingency planning.

For example, Kroger Co., a Cincinnati-based grocery chain, has company officials going door-to-door to local utilities to examine their year 2000 efforts.

At a recent hearing, U.S. Sen. Robert Bennett (R-Utah) praised Kroger for conducting its own, hard-nosed investigation instead of relying on overly optimistic industry surveys [CW, March 8].

Dennis Lynch, director of information technology at Turtle Wax Inc. in Bedford Park, Ill., said he "talks to other local companies" to find out what they're discovering about the year 2000-readiness of a common telecommunications carrier or utility. "We don't have the leverage to push" local carrier or utilities to set up independent testing, Lynch said, so relying on reports from other customers "helps somewhat as a reality check."

The Right Questions

The key is to ask the right questions and examine the details. To figure out whether Berkeley, Calif., residents would have water in the event of a power outage, a year 2000 advisory council had to pinpoint the exact location and capacity of reservoirs that feed the city's water system, said Bob Burnett, the council chairman.

"We asked about manual system overrides and how they would work. We tried to really get down under the skin of these things. We found out that if worse came to worse, they'd bring unpurified water to the main [distribution pipes] and warn everybody to boil it," Burnett said.

Burnett is a retired engineer and founding executive of Cisco Systems Inc. ◗

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"I am happy to flirt w

you." That's what you are about to say to a wealthy Chinese client instead of, "I am happy to meet you." Disaster is averted thanks to something called e-services. Picture this: Just before your meeting, you switch on a pocket device that electronically sends out a request for a translating service. You specify your requirements. Language? Mandarin. Duration of meeting? Two hours. Price? Five dollars per minute. Your request is instantly and electronically bid out, brokered and selected. Moments later you and your translator (in some other part of the world, you have no idea) are good to go. And when you address your prospective client you, thankfully, refrain from inadvertently insulting him. What's going on here? Businesses and services are using the Internet in ways that are hard to even imagine today. Not as a series of electronic storefronts. Not as a collection of websites. But as a catalyst for the service-based economy. The next chapter of the Internet is about to be written. And it will have nothing to do with you working the Web. Instead, the Internet will work for you. www.hp.com/e-services

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ORACLE APPS GET WEB-UPGRADED

Release 11i designed to link global systems

BY CRAIG STEDMAN
SAN DIEGO

ORACLE CORP. last week detailed plans to ship an upgrade of its Web-based ERP applications in the fall with a redesigned user interface and increased support for building global systems.

The beefed-up processing capabilities due in Release 11i are meant to reduce the need to spread enterprise resource planning (ERP) systems across multiple servers that run individual regions or business units. Release 11i is slated to ship in September.

The Road Ahead

Centralizing those systems is an appealing idea to users who want to lower technology support costs and make it easier to pull together information for analysis by corporate executives.

But going global isn't a simple matter, said several users after the Release 11i plans were announced at the spring conference of Oracle's independent applications user group.

"There are more issues than systems here," said Jeremy Young, finance business process manager for the European operations of DHL Worldwide Express in Diegem, Belgium.

For example, DHL has a highly decentralized culture that helped sprout 20 separate installations of Oracle's financial applications in Europe.

The delivery company is looking at centralizing the whole setup with Release 11i. But even if it decides to go ahead, DHL may initially just move the servers to one site and keep running them separately, Young said.

Otherwise, it could get stuck trying to deal with too many changes at one time, added Young, who is also president of the Oracle Applications Users Group.

On the technical side, users will have to upgrade to both Release 11i and the Oracle8i database, released last month. That's a big leap, especially for the many companies that run Oracle's green-screen applications. They would need to switch to Web-based systems and a graphical user interface with the upgrade.

The business issues global users face may be even more complex due to differences in language, culture and laws, said Josh Greenbaum, an analyst at Enterprise Applications Consulting in Berkeley, Calif.

For most users, Oracle said, Release 11i should be able to centrally manage multinational languages, currencies and business processes. The company also is promising improved scaling and data availability because of the combination with Oracle8i.

But even Oracle's own plan to consolidate all operations onto a single Release 11i system is expected to be an 18-month undertaking, said Ron Wohl, the company's senior vice president of applications development. "It's a big project," he said.

The same goes for Nike Inc., which runs Oracle's financial applications in 15 countries. Converging more than 70 separate databases "will be a tough project," said Scott Nasmyth, database administration manager at the Beaverton, Ore., footwear maker. Nike will probably end up having to keep separate servers for the U.S., Europe and Asia, he added. ▶

What's on the Way

Features in Release 11i will include:

- New user interface with a more graphical look
- Separate Web portal-like screens for self-service applications
- Self-service accounts receivable module for online billing
- Combined packaging with Oracle's front-office software

Oracle Zeros In on ERP Update for Consumer Goods Makers

Faced with continued problems in combining a set of internal and external applications, Oracle is starting to develop more of its own functionality for consumer packaged-goods (CPG) companies.

At the Oracle Applications Users Group conference, Oracle CEO Larry Ellison said order-entry features tailored to consumer goods makers will be built in to an upgrade of the company's ERP applications due late next year.

Oracle has relied on three smaller vendors to provide consumer goods functionality. But getting their software to work smoothly with Oracle's back-office applications was harder than expected, and Ellison said the order-entry piece has been especially problematic.

A promised upgrade of the Oracle CPG bundle will still be delivered, Ellison said. But "part of our obligation" now is to give users more choice between outside software and Oracle's own technology, he added.

Users such as Kellogg Co. and The J. M. Smucker Co. are finally going live with Oracle CPG after a series of fits and starts. But the bundling effort has given Oracle a black eye, said Jim Holincheck, an analyst at Giga Information Group Inc. in Cambridge, Mass.

– Craig Stedman

Compaq CEO's Exit Prompts Channel Questions in Europe

Analysts: Can vendor cut PC costs and serve enterprise IT shops?

BY JANA SANCHEZ
LONDON

Companies in Compaq Computer Corp.'s distribution channel could bear the brunt of radical changes that might be implemented as the company struggles to find its way again, according to industry watchers in Europe.

As industry observers assess what the departure of Eckhard Pfeiffer as Compaq CEO will mean in Europe, they consistently point to the channel as the arena in which the news will have the most impact. With PC profits at rock-bottom throughout the industry, Compaq, which is heavily reliant on resellers and distributors in Europe, has suffered more than rivals, such as Dell Computer Corp., that sell computers direct.

By cutting out the middleman, analysts said, Dell has been able to wring out more profits as PC prices continue to tumble. Increasingly, Compaq executives have suggested that the company would attempt to sell more computers directly to businesses.

At the same time, analysts wonder if Compaq would be better off focusing on the large corporate clients and services it inherited with the purchase of Digital Equipment Corp.

Critics said Compaq's integration of Digital in several European countries was far from smooth. The unit in France, for example, lost highly skilled staff.

And complaints about Compaq sales staff competing with Digital sales staff for corporate accounts, confusing customers and eating into profits, have been widely circulated in London, said Martha Bennett, a research analyst at Giga Information Group Inc. in Europe. If Compaq ends up focusing on corporate clients and services inherited from Digital, the channel would be increasingly important as a way to service and sell Compaq products to large companies in Europe, analysts said.

Compaq's reliance on the channel has hurt its profits, said Stephen Minton, an International Data Corp. analyst in London. Competition from Dell and regional PC manufacturers in Germany have put Compaq's reliable PC revenue under pressure. It will have little choice but to scale back its channel in favor of direct sales, Bennett said.

Still on Top?

Others disagreed. "Compaq has a preeminent position in the channel at the moment, and that's not something they will squander easily," said Howard Seabrook, an analyst at Gartner Group Inc. in London.

Seabrook said Compaq's problems are so wide-ranging that dealing with the channel won't be an isolated decision. "They have a basket of things that contribute to their ability to hit profits. One of these has got to be channel strategy," he said.

On the bright side: Rather than focusing on consumer sales, Compaq subsidiaries in Europe, the Middle East and Africa have done well among corporate users, Seabrook said.

Although Compaq's European PC business brings in 44% of its revenue, only about 6% of that comes from consumer PCs — a much lower percentage than in the U.S., according to Compaq. About 35% of its revenue is in corporate products, comprising servers, networking technology, workstations and storage, he said.

Europe, the Middle East and Africa "[have] always been a bit of a jewel in the crown for Compaq. It can survive in the short term quite well. Pfeiffer had a special feel for [those areas] because that's where his roots are. We hope that special relationship holds," Seabrook said. ▶

Sanchez writes for the IDG News Service in London. Jeanette Borzo contributed to this report from Paris.

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Report Shows Monitoring Of Employees on the Rise

Critics decry electronic tracking of behavior

BY TOM DIEDERICH

If you work at a major corporation, there's a 45% chance your employer is monitoring your e-mail, voice mail, computer files, phone calls or other workplace activities, according to a new report from the American Management Association (AMA).

Last year, 43% of the firms surveyed reported keeping tabs on their employees, up from 35% in 1997.

When additional forms of eavesdropping — including security cameras — are added to the equation, the percentage of companies engaged in electronic monitoring and surveillance climbs to 67% in the most recent survey. It was 63% in 1997, the AMA said.

The AMA, a nonprofit management-development organization in New York, based the findings on a poll of 1,054 human resources managers conducted by mail in January. It said the sample mirrored its corporate membership of 10,000 organizations, which employ a combined one-fourth of the U.S. workforce. The survey's margin of error was 3.5%.

Spot Checks

Most of the monitoring was performed as spot checks; 84% of the companies that said they kept a close eye on their employees' activities let them know beforehand that they were watching, the association said.

SHARON MACHLIS

MARC ROTENBERG of the Electronic Privacy Infomation Center says workplace privacy laws need toughening

But full disclosure isn't enough, according to one critic. Marc Rotenberg, executive director of the Electronic Privacy Information Center, said the study's results highlight the need for legislation protecting workers' rights.

"The Electronic Communications Privacy Act does a fairly good job at protecting privacy for commercial services. For example, if you sign up for America Online, people cannot routinely read your e-mail messages," Rotenberg said. "But when you use an electronic-mail system in the workplace, your privacy is not protected by law — and that's something that should change."

One problem is that the technology used to track employee behavior is improving rapidly, Rotenberg added.

"The Congress has, generally speaking, taken a go-slow approach to privacy. The problem is that the technology is not going slowly," he said.

The depth of employee monitoring will increase along with the development of automated tools like complex software filters designed to search for words and to send red flags to managers, Rotenberg said.

Many corporations said they must watch employees' actions not only to protect company secrets, but also to make sure workers are following the law. Some companies worry that they will be open to lawsuits if workers engage in inappropriate behavior on the job.

Because the AMA's corporate members are mostly mid-size and large companies, the group said the data didn't accurately reflect policies and practices in the overall U.S. economy, where smaller firms predominate. ◗

Survey Hits Federal Sites' Disclosures

Privacy policy access mocks own guidelines

BY ANN HARRISON

Many federal agency Web sites obscure their privacy policies in legal disclaimers or bury them deep inside, contrary to the government's own privacy guidelines, according to the Center for Democracy and Technology in Washington.

A study by the civil liberties group, released earlier this month, said that only one-third of federal Web sites have links from the agency home page to a privacy notice or policy.

Only half the sites offered this information within a few links.

Possible Problem

"The Internet offers access to government information that we have never had before, and if people are not comfortable with government Web sites, we are going to have a problem," said Ari Schwartz, a policy analyst at the center.

The study cited the Central Intelligence Agency and the U.S. Department of Veterans Affairs as organizations with particularly bad privacy policies that didn't post privacy notices on their sites.

The Veterans Affairs Department responded to the study by posting a privacy statement on the first page of its Web site (*www.va.gov/privacy*), said spokesman Ken McKinnon.

McKinnon said information identifying which companies and organizations accessed the site most often has been removed because of privacy concerns. ◗

IBM, STORAGETEK TAKE DRIVES OUT OF NEUTRAL

STORAGE DEVICES

Magstar update pushes performance

BY JAIKUMAR VIJAYAN

A NEW, high-capacity tape storage product from IBM promises to double capacity and significantly boost data backup times at current prices.

IBM last week introduced the Magstar 3950 E model, its first major upgrade of the technology since it was introduced in 1995. The new tape cartridge boosts storage capacity from 10G to 20G bytes and features a data transfer rate of 14M bytes/sec., compared with 9M bytes/sec. on the previous 3950 B model. Prices start at $43,500, or the same price as the B model before the introduction of the E model.

Prices on B models have been dropped to $29,500.

The new systems "give users lower cost per megabyte of storage and boosts productivity" with its fast backup times, said Robert Abraham, an analyst at Freeman Associates Inc. a storage consultancy in Santa Barbara, Calif.

More Compatible

A crucial feature on the 3950 E model is its backwards-read compatibility feature.

The feature allows tapes that were backed up using the previous generation 3950 model to be read by the new model — allowing users to upgrade systems instead of replacing them.

That's a significant improvement over previous tape products — like IBM's 3490 generation — which typically required users to do forklift upgrades, Abraham said.

Users can upgrade their storage boxes to the new models for a $15,000 fee, an IBM spokeswoman said last week. ◗

StorageTek revives direct-sales method

BY KATHLEEN OHLSON

AFTER TAKING a backseat in the enterprise storage arena for two and a half years, Storage Technology Corp. is making another go at the market by selling its virtual disk products directly to corporate customers.

IBM has been selling its Ramac drives in the meantime, but the contract to use StorageTek technology expires next year.

StorageTek's re-entry into direct sales comes at a time when it's suffering disappointing earnings — less than one-fourth of what analysts predicted for the latest fiscal quarter — and has had to lay off nearly 6% of its staff.

StorageTek has sustained several losses in the past few years, and that may discourage companies from using its products, said Kirby Lambert, technical director at MGI Studio, a Dallas-based prepress studio.

Louisville, Colo.-based StorageTek is trying to expand its products and services, and "they need to go forward regardless of short-term earnings," said analyst David Hill at Aberdeen Group Inc. in Boston.

StorageTek plans to include its virtual architecture with mainframe and Unix storage systems. And it will directly sell its 9393 Shared Virtual Array (SVA). The 9393 SVA product for IBM's OS/390 is shipping now, and the Unix version will be available by July, IBM said.

StorageTek is also heading for this market through third parties. It's developing High Speed Data Mover software with Innovation Data Processing and the Transport Data Migration Facility data tool with Amdahl Corp. ◗

The Melissa Virus Lesson: Quicker Reaction Needed

BY PATRICK THIBODEAU
WASHINGTON

The next time a virus like Melissa strikes, corporate and government systems administrators need one big thing from emergency response groups: quicker notification. The sooner, the better.

That was the advice a panel of security experts gave April 15 to a congressional subcommittee that was looking for "lessons learned" from the recent, fast-moving Melissa virus. "In retrospect, we're going to have to be faster," said Raymond Kammer, director of the National Institute of Standards and Technology in Gaithersburg, Md.

Testifying before the House Subcommittee on Technology, Kammer and other security experts said the Melissa virus was contained by its weekend launch and the media blitz that warned office workers about it that Monday, March 29.

Bigger Than Y2K?

Rep. Connie Morella (R-Md.), the subcommittee chairwoman who organized what may have been the first-ever congressional hearing on a specific virus, said the issue of computer security "has the potential to dwarf the millennium bug" in importance.

"This has exposed a weakness in our systems," added Rep. Gil Gutknecht (R-Minn.), subcommittee vice chairman. "Here we are dropping bombs on an enemy 5,000 miles away, and someone in the U.S. has figured out a way to terrorize us without firing a shot."

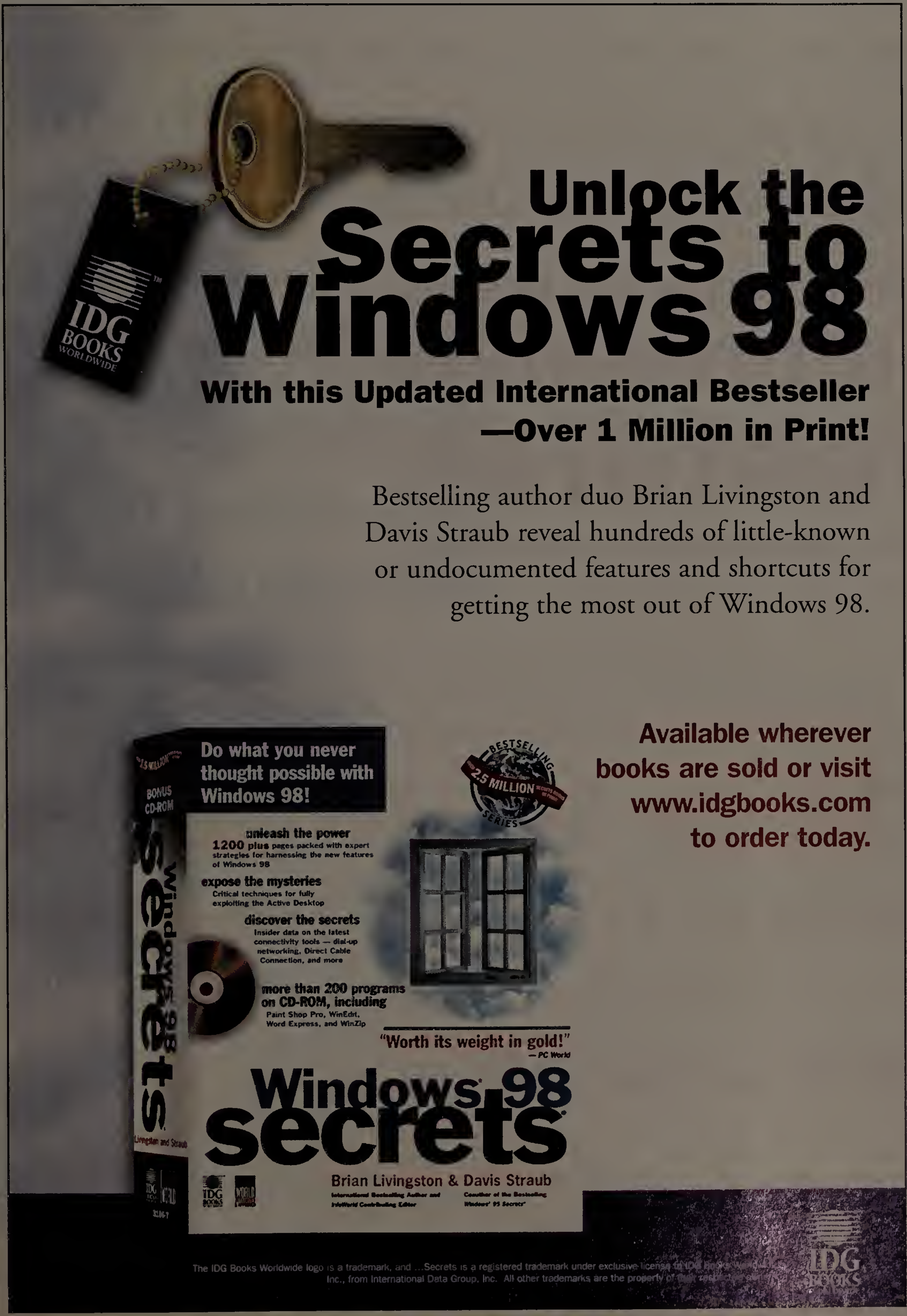
The Computer Emergency Response Team (CERT) Coordination Center received the first report of the Microsoft Word macro infection at 2 p.m. Friday, March 26. Eight hours later, CERT gave early warning to U.S. Department of Defense response teams, the FBI and other agencies. Warnings from federal agencies and CERT began to appear after midnight Saturday.

Even with its weekend arrival, the virus still infected at least 81,000 corporate, government and institutional computer systems. Melissa, made up of 105 lines of code, used the address book in Microsoft Corp.'s Outlook messaging software to flood networks with e-mail, shutting down some e-mail servers.

Richard Pethia, who manages CERT, said new forms of communication are needed to give systems administrators real-time status of network events. He also said users must demand virus-proof software.

"There is nothing intrinsic about digital computers or software that makes them vulnerable to virus attack or infestations," he noted.

Police have arrested David Smith, 30, an information technology consultant from New Jersey, in connection with the incident. ▶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"SQL Server 7.0 boasts **impressive features** that administrators and users will both appreciate." *– InfoWorld*[3]

"SQL Server 7.0 provides the flexibility, relational power, and continued ease of use that should put the product in **the corporate winner's circle.**" *– Intelligent Enterprise*[4]

"We recommend that you consider SQL Server 7.0 for new data warehousing projects ranging from departmental and line-of-business **data warehousing even to the enterprise,** especially if you're already a [Windows] NT shop." *– Mitch Kramer, Patricia Seybold Group*

PC Week Best of Show, *COMDEX/Fall 1998*

Database and Server Software 1998 Product of the Year *– InfoWorld*[5]

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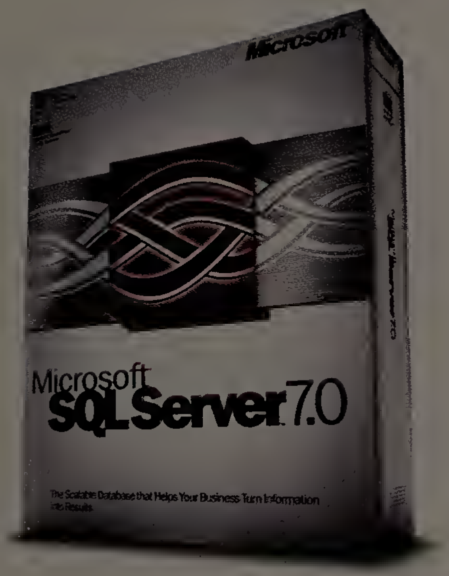
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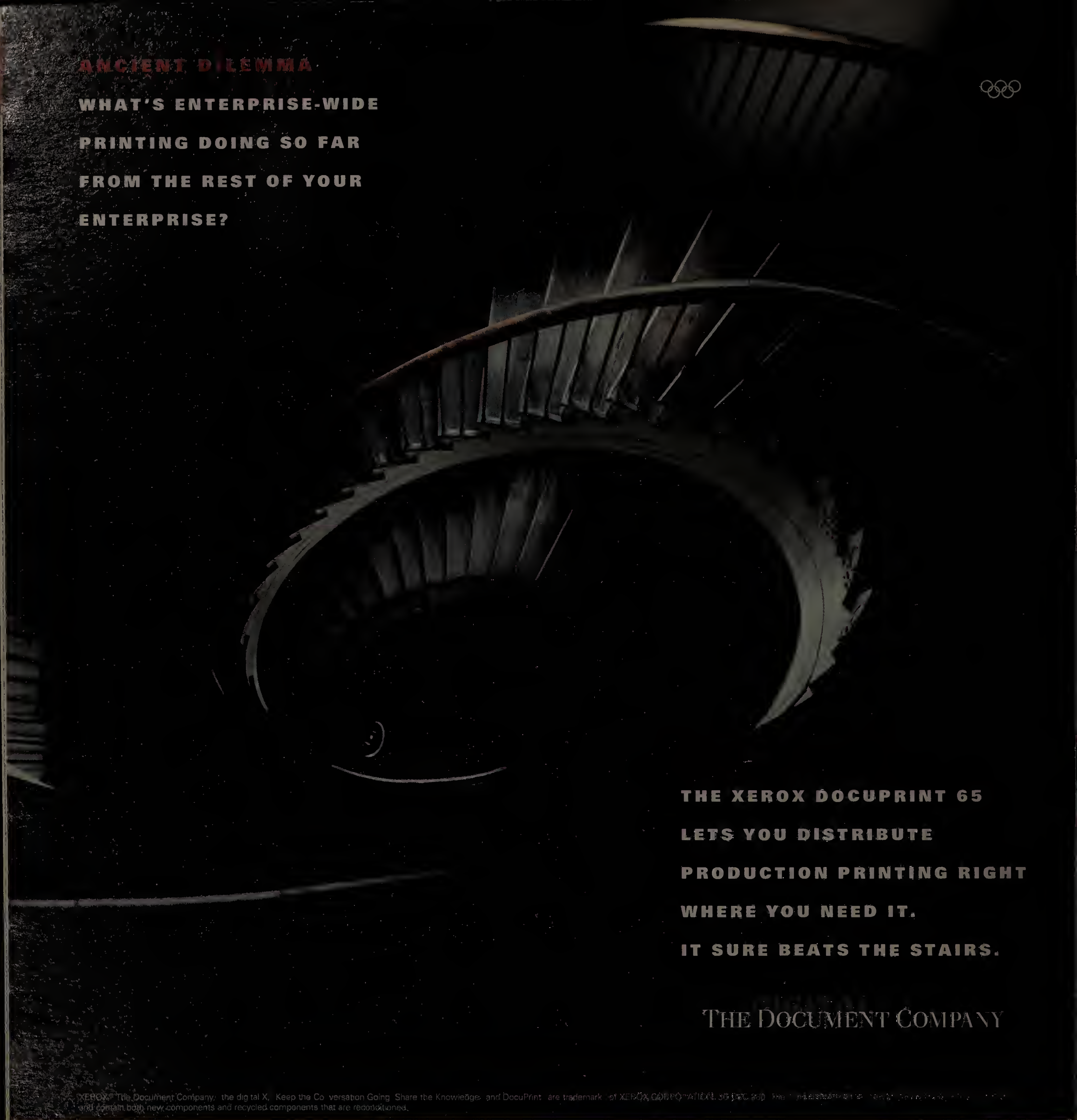

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BRIEFS

German, Italian Telco Giants To Merge

Deutsche Telekom AG and Telecom Italia SpA said they will merge in an $82.7 billion deal that would create the world's second-largest telecommunications company. The German and Italian companies said the still-unnamed new entity would have co-CEOs.

The German government, which owns 72% of Deutsche Telekom, said it wouldn't participate in the merged company's capital increase. European regulators and shareholders still must approve the deal, which would fend off a bid by Olivetti SpA to acquire Telecom Italia.

Middleware Maker Buys R/3 Firm

New Era of Networks Inc., a Denver-based enterprise applications integrator, said it was acquiring SAP R/3 service provider SLI International AG for $22 million in cash and stock.

The deal could reach $25 million if certain financial goals are met, the companies said.

New Online Grocery Effort

Borders Books co-founder Louis Borders is expected next month to launch an online grocery business called Webvan. It will fill Web-based orders from a new mega-warehouse in Oakland, Calif. The new business is backed by media giants CBS Inc. and Knight-Ridder Co., among others, and reportedly has attracted $120 million in venture funding.

Webvan will compete with online grocer Peapod Inc., which reported a loss of $21 million on sales of $69 million last year.

Short Takes

Ottawa-based COREL CORP. said it is buying Web-based clip art company GraphiCorp in Los Angeles. . . . DATACHANNEL INC. in Bellevue, Wash., said it will merge with ISOGEN INTERNATIONAL CORP., and make the Dallas-based company its services arm.

CA UNVEILS STRATEGY FOR E-COMMERCE APPS

Company unit to integrate technologies, build analysis tools for business users

BY BOB WALLACE

IN A BID TO ATTACK the e-commerce market, Computer Associates International Inc. last week said it would build BizWorks, a framework for integrating applications to give senior management a consolidated overview of business processes.

Officials at Islandia, N.Y.-based CA said the framework, due in the second half of the year, eventually will enable companies to support inter-business communications over the Internet.

BizWorks will integrate CA and third-party applications atop the vendor's object-oriented Jasmine database, 3D visualization products and neural networks technology.

CA said its five applications business units will report to a InterBiz Solutions division under Rueven Battat, formerly CA's senior vice president of research and development.

"This could be a way for them to light a fire under what has been a flat [applications] business for them," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

Mason said the initiative would have "exciting possibilities" if it allowed users to pull in information from multiple applications across an enterprise and have CA's neural networking technology identify unusual business patterns.

But CA faces an uphill battle in establishing itself as an electronic-commerce power.

"It remains to be seen if CA will be successful — especially considering that this space is becoming crowded with heavy hitters like IBM, Microsoft and the NetScape-Sun-AOL triumvirate," said Heather Ashton, an analyst at Hurwitz Group Inc. in Framingham, Mass.

Those players have "done a very good job convincing users that they understand electronic business, whereas CA doesn't have any visibility as an e-business company. That presents a big challenge," Ashton said. ◗

SAS President Discusses New DSS Plans

Challenges ERP vendors' capability

SAS Institute Inc.'s new approach to decision support arrives with uncharacteristically sassy warnings for enterprise resource planning (ERP) vendors invading its lucrative turf. "We intend to aggressively defend our territory," CEO James Goodnight said.

At its user group meeting April 15, SAS announced the Information Delivery Architecture (IDA), designed to pull corporate data from many sources and present them in ways that make it easier for business analysts to make predictions about marketing, sales and other metrics. *Computerworld* industry editor Joseph E. Maglitta spoke with **Barrett R. Joyner**, president of SAS Institute for North America, about the company's strategy.

Q: Why shouldn't IT people buy decision-support systems (DSS) from ERP vendors?

A: Just because you've had a successful ERP run, don't assume they are building on a validated DSS legacy. Rarely do . . . ERP vendors truly understand the flexibility needed for business intelligence.

Don't come to me at SAS for efficiency and cost savings of regimented, repeatable processes. ERP vendors do that extremely well. By the same token, you should not go to them for the flexible, creativity enriched applications required on the DSS side.

You need to translate information into a form stored for decision support and provide access based on that function, not transactions.

Q&A

Q: What's your feeling on best-of-breed approaches to enterprise decision support?

A: Best of breed can be awful confusing. We want to be the strategic vendors for data warehousing and decision support. It would take a loose federation of four or five or six vendors to come close to being able to implement what we can do. When it comes to enterprise-decision support, we like to think of SAS Institute as best of breed.

It's not a world of reads and feeds. It means understanding data [and] the creative process of decision making. If one of the ERP vendors wants to do that, they will not have a corporate culture that is good for ERP. We have no problem competing with them.

Q: What's your channel strategy?

A: We've been working through the channel aggressively. We've got strong alliances with Price WaterhouseCoopers, KPMG [Peat Marwick LLP] and others. We're investigating other possibilities. ◗

Quarterly Earnings Report

COMPANY * REFERS TO CALENDAR FIRST QUARTER	Q1 REVENUE 1999	Q1 REVENUE 1998	Q1 NET INCOME* (LOSS) 1999	Q1 NET INCOME* (LOSS) 1998
Compaq Computer Corp.	$9.42B	$5.69B	$281M	$16M
Data General Corp.	$355.3M	$361.8M	$1.7M	($4.5M)
ETrade Group Inc.	$126.7M	$56.1M	($14.3M)	$4.5M
IBM	$20.3B	$17.6B	$1.5B	$1.03B
Lucent Technologies Inc.	$8.2B	$6.2B	$457M	$186M
Microsoft Corp.	$4.33B	$3.77B	$1.92B	$1.34B
PeopleSoft Inc.	$305.4M	$275M	$7.6M	$33.8M
SAP AG	$1.16B	$953.3M	$106M	$114.6M
Siemens AG	$33.6B	$28.6B	$76M	$65M
Unisys Corp.	$1.81B	$1.65B	$111.2M	$62.7M

Last week's earnings reports showed some diversity, with clear winners and losers. Compaq's numbers show increases from its acquisitions, but the numbers were less than expected. IBM and Microsoft exceeded analysts' projections, and AT&T spin-off Lucent Technologies continued its growth spurt. Numbers from enterprise resource planning vendors SAP and PeopleSoft prompted some analysts to lower expectations for the next quarter.

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Forever his fans

RICH TENNANT'S FAREWELL editorial cartoon sits below, striking a graceful end note to his 12 years on this page. We're the bemused victims of Rich's tremendous success. He's taking a much-deserved break from the editorial cartooning grind to devote more time to the other, booming parts of his business. Those include his popular "5th Wave" cartoons (which will continue in *Computerworld*), his illustrations in the IDG Books "For Dummies" series of how-to books and his up-and-coming Web site (*richtennant.com*).

MARYFRAN JOHNSON is executive editor of *Computerworld*. Contact her at **maryfran_johnson@computerworld.com.**

"The ironic thing about me is that my life is doing jokes about computers, but I myself haven't had time to build my own Web site or mess around with computers," he said last week, with just a trace of Geek Envy.

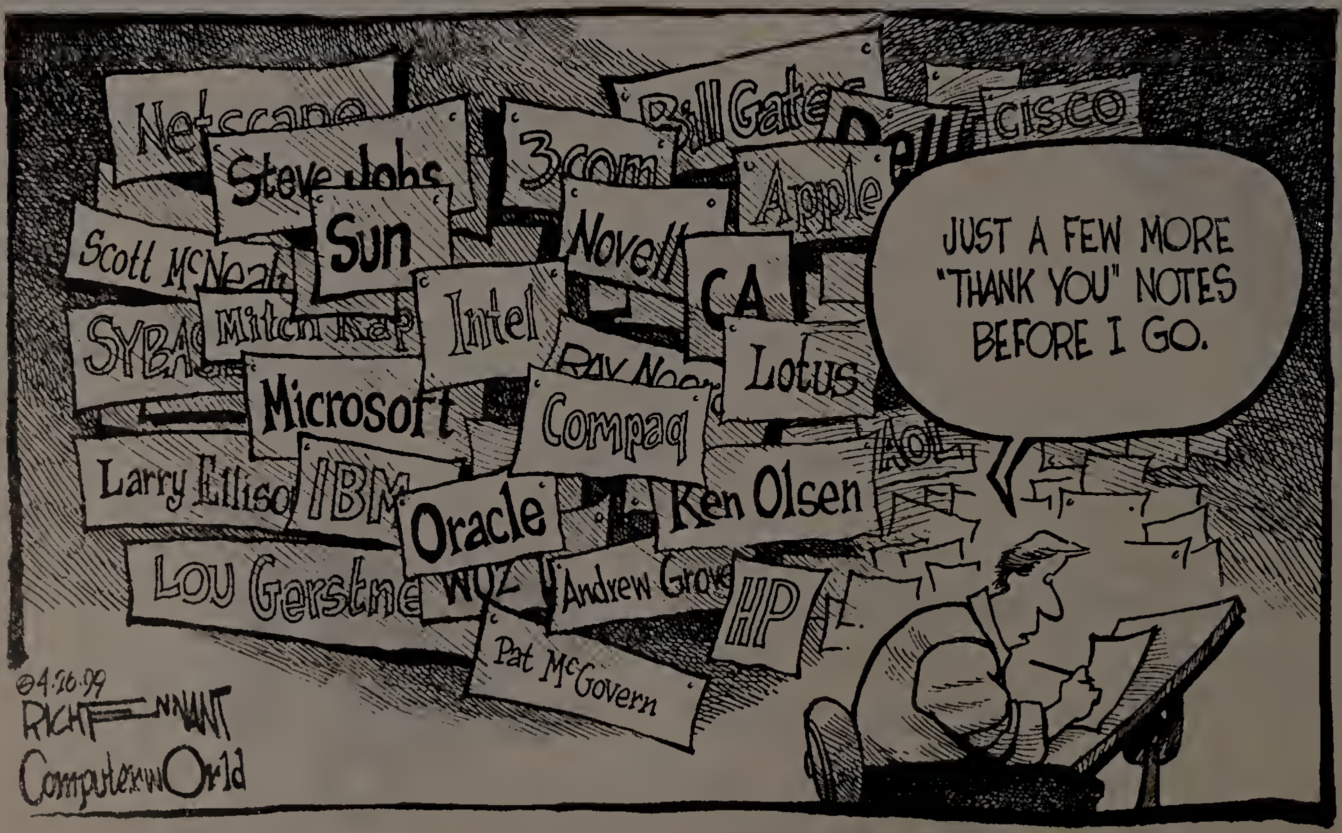
His career path actually meandered a bit before he found his true calling at age 35. He sold vacuum cleaners. He played jazz piano. He trained as a paralegal. He wrote advertising copy. His first break as a cartoonist came in 1987, right after we, er, fired him.

"I really credit *Computerworld* for firing me," he cheerfully recalled of that miserable, long-ago job as a typesetter in our production department. "It forced me to draw upon [pun intended] what talents I had!"

Soon, the Chicago native was cranking out cartoons and illustrations to fill holes on our pages. Then the calls started coming in, as people noticed the quirky, lighthearted way he poked fun at the computer industry and its top execs.

Once Rich got a call from a secretary whose boss wanted to buy the original of a cartoon depicting the new IBM CEO pushing a limo — laden with ancient, cranky shareholders — up a hill. He quoted a $300 price, and they had a deal. "Then she started giving me Lou Gerstner's address, and I said, 'Oh no, wait! I meant $300 a month for 10 years!' "

For a while now, Rich has been sharing his space on this page with John Klossner of Cambridge, Mass., whom we welcome now as our full-time cartoonist. And while we'll miss you, Rich, we'll still be watching your work. Consider us forever your fans. ◗

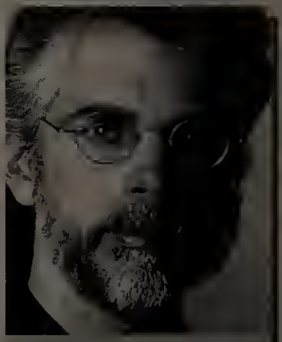


WILLIAM ULRICH

Validate your Y2K contingency plans

PUBLICLY TRADED companies, government agencies, municipalities and small businesses are drafting year 2000 contingency plans. Strategies include increasing inventories, installing generators, creating backup communication systems, crafting manual alternatives and ensuring that support teams are on-site during the millennium rollover.

But how can you be sure that your plans will work? The answer is to validate your year 2000 contingency plans, which will ensure that your business transitions successfully into the new millennium.



WILLIAM ULRICH is president of Tactical Strategy Group Inc. and co-founder of Triaxsys Research LLP. Contact him at **tsginc@cruzio.com.**

Validating a contingency plan is a two-phase process. The first step involves getting a second opinion on the comprehensiveness and structure of your contingency plan. The second step requires testing contingency options before you actually invoke them.

Scheduling independent reviews and testing year 2000 contingency plans help nullify possible disruptions from a technology-related or third-party year 2000 failure. Independent contingency reviews confirm that your plans are structured to deal with multiple failures across mission-critical functions, technologies and third parties. Testing contingency options verifies that contingencies that you did consider have the bugs worked out *before* they are deployed.

I have heard numerous arguments for avoiding a contingency review. Some executives believe that their team is astute at drafting plans for contingencies in their area of expertise. Although in-house teams are essential to this process, my experience has shown that creating enterprisewide contingency plans is a complex process that typically omits many essential planning elements.

Many plans, for example, omit contingencies for systems or suppliers considered compliant. And few companies have developed the ability to rationalize redundant plans across business units, formally track plan development and execution, assess impacts between tactical plans and business continuity strategies or deal with crisis management. Independent reviews shed light on these and other issues that in-house teams may have missed.

Testing contingency plans lets the operation teams try out different scenarios to see which will and will not work. Utilities tested their communication failure contingencies and found that they didn't have all of the right phone numbers in place. Another company found that it hadn't considered that a power outage also meant that its gas pumps wouldn't fuel its propane transport trucks. Ongoing contingency testing should be a high priority throughout the remainder of this year.

Testing your contingencies is important, but only insofar as you have created the right contingency plans to test. That is why I recommend getting a second opinion on your contingency plans. Outsiders can spot holes in contingency strategies that you may have missed. Help can come from industry associations, other divisions within your company, other agencies in your government structure or outside consultants. Validating your contingency plans is time well spent if it prevents major failures in mission-critical business functions. ◗

DAVID MOSCHELLA

Turbulent future for IT pros: New bosses, new roles

ONE OF THE THINGS I admire most about *Computerworld* is its sincere interest in the careers of its readers. For its entire 33-year history, it has focused on serving the same IT community, taking you through all the many changes our industry has seen. So it was with particular interest that I read *Computerworld*'s April 12 cover story predicting the future of the IT organization and its implications for IT professionals.

DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at **dmoschella@earthlink.net.**

Not surprisingly, that story focused on things like the need for closer business/IT interaction, the rising influence of end-user departments, the increasing use of outsourcing, the benefits of centralized architectural planning, enhanced CIO stature and other, mostly positive trends. For the next few years, all of this seems on track.

Nevertheless, I would like to suggest a different and significantly more turbulent future.

There's an old and reliable rule of forecasting that says that the expected impact of a major paradigm shift is usually seriously overestimated in the short run but greatly underestimated in the long run. Given that the IT industry is changing profoundly, it seems only natural that the careers of IT professionals will also be profoundly affected.

The main engine of change will be a growing reliance on network services. Imagine your company being increasingly devoid of software and the systems it runs on. Instead of installing and managing products, your business will mostly contract for various online services. Your accounting, human resources and customer service groups will buy online capabilities, just like we buy telephone or electricity services today.

Similarly, we're heading toward an environment largely devoid of physical network management concerns. Acquiring network capacity or outsourcing a unified messaging system will be pretty much like buying utilities today: The main emphasis will be on services with considerably less focus on customer-premises equipment. You won't be buying or managing routers and switches, your service provider will.

Technology usage will move this way because it's the most cost-effective path. Network services enable scarce talent to be much more fully leveraged. It's silly for every company to have its own expertise in SAP, Oracle, Cisco or similar technologies. Consequently, the demand for technical talent will shift away from end-user companies and toward the service providers themselves. A decade hence, many of you will be working for IT vendors, which will generally pay you better and treat you with more respect.

Network services will also accelerate the independence of business units. It's much easier for departments to buy IT services than to manage their own IT activity.

But in order to make good business decisions, end users will need to understand, for example, how Internet advertising, marketing and transaction processing really work. IT-savvy personnel who understand specific business functions will be in great demand, and thus many of you will eventually work in end-user departments. These groups will also treat you well — if you're really part of the team.

Centralized IT operations won't go away entirely, but they will become much smaller — and in many ways much less strategic. Twenty years from now, business students will marvel that there was a time when what was called "information processing" was actually separate from the business itself and that most big companies insisted on maintaining a complete range of centralized IT skills. Those days are numbered. And IT professionals will eventually have a whole new set of bosses and opportunities. ◗

READERS' LETTERS

'Just Postpone 2000' by setting back clocks

IF POWER PLANTS and other vital services fail next Jan. 1, remember: It would cause significant billing, reconciliation and other problems to do so, but we always have the option to set system clocks back to pre-2000 to buy additional time to fix systems. "Just Postpone 2000" bumper stickers, anyone?

Pete Burris
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Many gains from breaking up Microsoft

I ENJOYED READING Kim S. Nash's article on the impact of the Microsoft antitrust trial on the user community ["User Voice Is Missing From Microsoft Trial," Feb. 15]. I believe there is another remedy available with great potential benefits for the software industry. Simply break Microsoft into two or more competing companies, each with access to the full range of Microsoft intellectual properties.

This does two things: It ensures competition in Microsoft's markets without government regulatory oversight, and it creates a virtual explosion of innovation and quality improvement in our industry.

Users win because Microsoft responds to competition. Microsoft stockholders win because competition will force the company to innovate and therefore create more customer value.

Jay Smith
Vincennes, Ind.
jaysmith@amsinc.com

Expense just part of doing business

I JUST FINISHED reading the article in the March 8 issue of *Computerworld* about Ford suppliers getting asked to help design the components that go into Ford products ["Ford Suppliers Get Call to Design"]. The article tries to make Ford look good by trying to streamline operations. This is just another example of Ford trying to pawn off expenses onto suppliers.

Suppliers should get together and make Ford shoulder the responsibility of designing its own products. If a company doesn't want to incur expenses when building a product, it should get out of the business.

Patrick Retherford
Cincinnati
pretherford@fdlawrence.com

Lawyers find new Y2K target in retailers

I READ IN amazement the article "Lawsuit Pegs Retailers as Y2K Scofflaws." I guess this is the first salvo fired by the legal profession in what will be the biggest money maker of all time.

California law firms must be at a loss for something constructive to do now that they are looking at retailers as scapegoats for selling non-Y2K compliant software. Retailers must look like easy prey for a wave of billable hours and litigation.

If this is allowed to continue, our courts will be so gridlocked that those with worthwhile legal concerns might as well forget ever getting their day in court. My only hope is that there are judges who will come down hard on such frivolous lawsuits.

Terry L. Hoyum
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COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

JOHN GANTZ

E-commerce: Here's what you need to know

CHANCES ARE one in three that your company will be offering goods or services for sale over your corporate Web site this year. And your chances are a lot better than that — if this is your first year with a site that handles transactions over the Web — that you'll repeat many of the mistakes of the e-commerce pioneers. So let me offer you some benchmarks. International Data Corp. recently surveyed more than 100 of the nation's top Web sellers. For one, you are probably going to start offering e-commerce on your site because you want to reach new customers — as do nine out of 10 Web sellers. You'll also do it for all those good motherhood-and-apple-pie reasons, like improving customer loyalty, increasing revenue per customer and improving customer service. You may not, however, tell customers that cutting costs was the real reason you got approval from your own finance division to invest in the site.

JOHN GANTZ is senior vice president of research at International Data Corp. Contact him at **jgantz@idcresearch.com.**

But do you know how much and on what you'll be spending to bring transactions to the site? More than 30% of the surveyed sites spent in excess of $1 million getting all that up and running, and another 10% spent at least $10 million. What's often not readily apparent to newcomers is that site maintenance costs as much per year as its initial development.

Your top worry will be — or should be — data integrity, followed by reliability and security. What isn't so clear is that ease of use — the perennial Holy Grail — will be your fourth most important worry. Products sold online are only as good as the customer's experience online. A good Web site won't sell lousy products, but a lousy Web site can kill sales of great products.

Chances are also good that you'll underestimate the cost of dealing with these new customers: About 23% of the pages you deliver and 10% of your e-commerce dollars will come from outside the country. That means investments in local-language sections of the site, the agony of handling foreign currencies and — to the horror of many companies — a requirement that you rationalize prices and features across geographies. By the way, do your country managers even know you're selling products to their customers over the Web?

Finally, the bold pioneer in your company who was handed the task of making e-commerce work — is that you? — will be facing obstacles e-commerce evangelists often overlook. Besides coming up with around-the-clock support, there's also the issue of the high expectations people have for the e-commerce experience (thank you, Amazon.com) and the generally poor impressions they get of sites in their first incarnation.

Integration with back-end systems always takes longer and costs more than expected because the keepers of those systems generally resist letting other development teams monkey with them.

It's also easy to forget how many marketing dollars it can cost to drive traffic to a site — you don't just open the doors and wait for business to walk in. And let's not even mention company culture issues. If you wait to solve them before doing business online, you won't have any business to do by the time your Web site is up.

That's the key. If you don't go online, you run the risk of going off-line. Try to get that message across. ◗

DON TAPSCOTT

IBM is showing leadership on the privacy issue

WHY DO SO MANY companies force their customers to lie to them online? At least four out of 10 Internet users admit to giving false answers to Web site questionnaires to capture a proffered benefit. People routinely give bogus names, incomes, ages and gender or say they live somewhere they don't. They do it because they don't feel the company asking the questions has the right to the information, or they aren't sure what will be done with the information that they supply.

DON TAPSCOTT is a consultant. His latest book, *Creating Value in the Digital Economy*, is due this week. Contact him at **column@tapscott.com.**

I don't condone this behavior, but I can't blame consumers. Companies are compiling and trading information at an unprecedented scale to build detailed profiles about their coveted customers.

Computing power and network technologies have made this so cheap and easy to do — so why not?

But the public is getting fed up. We are starting to see the backlash, such as the high percentage of bogus answers. Even worse, many consumers simply refuse to do business on the Web. They fear having any personal information sucked into the Net's maw and used for unauthorized and perhaps even dangerous purposes.

Such widespread consumer unease seriously impedes the Web's growth. Companies have got to understand that the protection of privacy isn't just a social or ethical issue. It's a dollars-and-cents business issue.

That's why I applaud IBM's recent announcement that it will no longer buy advertising on any U.S. or Canadian Internet site that doesn't post an effective privacy policy. This should be a wake-up call to many Web-site operators that don't want to be excluded from IBM's $60 million annual Web advertising budget.

IBM believes that consumers visiting a Web site should:

- Have easy access to a company's privacy policy.
- Be told clearly what information is being collected and how it will be used.
- Have a choice of whether to provide any information.

Other corporations should be spurred by the IBM announcement to examine their own privacy policies.

If a company doesn't fully understand all facets of the privacy issue, it should bring in outside expertise that will give it a blunt assessment of its policy — assuming it has one. Amazingly, many companies don't even have a written policy on this issue. This isn't out of malice; often, companies simply don't know better.

Even industry leaders fall short on this subject. Look at one of the Web's flagship retailers, Amazon.com. Its computers can recall the books, videos and CDs a customer has previously purchased and recommend new items based on this information and what other customers have bought.

Netizens know that it can feel great for Web sites to have such a thorough knowledge of their tastes and preferences. Amazon.com prides itself on this. But can Netizens do business with Amazon.com secure in the knowledge that the information it gathers will be used responsibly?

It's hard to say. Its Web site makes the following statement: "Amazon.com does not sell, trade or rent your personal information to others. We may choose to do so in the future with trustworthy third parties, but you can tell us not to by sending a blank e-mail message to never@amazon.com."

Good enough? I don't think so. What happens if a credit agency decides to start offering companies character profiles of potential employees? Would Amazon.com sell that "trustworthy" company a list of everything I've read, watched and listened to?

And why do I have to tell Amazon.com not to peddle information it gathers about me to other companies? Why can't the company show leadership and say it will keep this information confidential unless I say otherwise?

Companies should realize this is an issue where they must be totally scrupulous. Otherwise, they hurt themselves and the entire online industry. ◗

BUSINESS

CREATIVE PRICING

Per-hour pricing is passé on some projects. Users are demanding — and getting — performance guarantees, set prices and other concessions on projects that have to have a high impact and have to be finished quickly. ▸ **36**

WHO'S THE CUSTOMER?

These two natural-food vendors have remarkably similar content on their Web sites, but remarkably different strategies for self-promotion. The established one stays low key, aims at customers. The Web start-up struts for Wall Street. ▸ **49**

NEAR-FATAL CAREER ERRORS

Want to really shred your new career as a consultant? Three experienced consultants describe their near-fatal career mistakes and the lessons they learned from them. You can never be too prepared for a new contract, they say. ▸ **58**

RED-HOT TRAINING TIPS

Do you need a training program, but you're not sure what method works best? We evaluate the pros and cons of in-person, computer-based and Web-based training, as well as videos and books to see which is most effective. ▸ **61**

WHERE DOES IT FIT IN?

IT managers talk about their value to management, but their greatest impact has been in automating operations, not contributing new knowledge, says management guru Peter F. Drucker. IT needs to refocus. ▸ **51**

THOSE PHONY CONTRACT FEES

Software vendors are socking customers with new fees for a service that has always been free, Joe Auer warns. "Upgrade insurance" gives the illusion of security on software updates that should be part of ordinary maintenance contracts. ▸ **63**

SPEED CONTROL

Is business changing at the speed of thought? Yep, says Jim Champy. But reacting to rapid change with more rapid change will wear down any organization. You've got to pick your speed and build your systems to compensate. ▸ **53**

COMFORT LEVEL

Telecommuting might not work for IT at all companies, but it's been a boon at Merrill Lynch. Training workers so they acclimate to live with a phone and modem is part of the trick. ▸ **50**

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MARK LUIENENBURG

PREPARING FOR THE BIG EVENT

YEAR 2000 remediation and testing are nearly done. Now it's time to talk logistics, staffing, power surges, SWAT teams and command centers — the stuff that will keep you online come New Year's Eve. For IT managers like Nancy Mitchell of Pillsbury Co. (above), that process is already under way.

55

REPORTING TO CEO CRITICAL FOR CIOs

Illustrates that IT is strategic to company

BY BARB COLE-GOMOLSKI

THE PROFILE of IT has risen in the organization, which means IT managers need to understand the unwritten rules of the business or risk failure. So CIOs have developed ways to gauge corporate cultures and figure out whether or not a culture supports their management style [CW, April 12].

One way that CIOs interpret corporate culture, and just how strategic information technology is to a company, is by whom they will report to. Most CIOs said it's essential to their success that they report to the CEO rather than the chief operating officer or chief financial officer.

MARS SUPERSTORES' Keith Hammer: Open lines to CEO are vital

"Whether or not you report to the CEO communicates a lot about what they really think of IT," said Keith Hammer, CIO at Mars Music and Recording Superstores in Fort Lauderdale, Fla. If the CIO doesn't report to the CEO, it could be because the CEO isn't comfortable with technical issues, he said.

"The degree to which a company gives strategic credence to the technology function will also determine how much time and energy will be spent educating people and justifying projects that ought to be no-brainers," Hammer said.

Some CIOs switch jobs for a better culture match. Wayne Sadin left his job as chief technology officer at Michigan National Bank in Lansing to become CIO at Bank United in Houston a year ago. He said the management team at his new employer excited him because they "realized that technology is vital for understanding customers."

"This bank believes in using technology to drive new products and revenues," Sadin said.

RICH PRODUCTS CIO Mike Crowley is seen as a key strategist

Mike Crowley, now CIO at Rich Products Corp., spent 26 years at PPG Industries Inc. before moving to the Buffalo, N.Y.-based food manufacturer four years ago. Though Rich's IT department is about one-fourth the size of Pittsburgh-based PPG's, Crowley now reports to the president and is viewed as a key strategist at the company.

"In some companies, the CIO is brought in after the decisions are made," he said. If you don't get a seat at the management table, "it gnaws at you," he said.

Cathy Bruno, CIO at Ohio State University Hospitals in Columbus, said she looks at "how an organization works together as a team." Participation by end users in large projects is also important, she said. ◗

Integrators Get Creative on Project Pricing

Pay per hour is passé for hot tech jobs as shops reward contractors for assuming risk

BY JULIA KING

Forget hourly rates. Users are demanding more innovative pricing arrangements that reward systems integrators for assuming risk and delivering projects fast.

Take Utica National Insurance Group, which is paying Tenfold Corp., a Salt Lake City-based integrator, to develop and install new computer systems across 11 business divisions in just 18 months.

When completed, the systems will give independent agents nationwide access to all customer and business information via the Internet, anywhere and anytime. It's a fixed-price deal.

"A project of a similar scale might have been scoped out at five years. But speed is critical on this project because technology is changing so fast," said Brian Lytwynec, senior vice president of commercial lines at the $600 million Utica, N.Y.-based insurer.

"If we take several years to put the system up, we feel we'll have invested in something obsolete before we get productive use out of it," Lytwynec said. "That's what makes the fixed time so important."

Meanwhile, if Tenfold fails to deliver, Utica pays nothing under Tenfold's highly unusual money-back guarantee.

Much more common are fixed-time/fixed-price contracts under which an integrator's fee decreases with each day or week a project runs beyond the original delivery date.

"We try to do fixed-time/fixed-price whenever possible because you're then running on the service provider's nickel. If they get it done early, they make extra money," said Dave Whitinger, an information technology contract manager at Kellogg Co. in Battle Creek, Mich.

Conversely, "a time and materials contract is essentially a blank check. The supplier isn't motivated to complete a project on time," Whitinger said.

Also on the rise are shared-risk/shared-reward contracts, which begin to pay integrators only after a finished system begins delivering benefits. Chicago-based Andersen Consulting works under that model on between 70% and 80% of projects with government agencies, said Ed Burke, an Andersen managing partner in Boston.

Still other integrators are acting as full-fledged business partners with fledgling e-commerce companies. ◗

Contract Types

FIXED TIME/FIXED PRICE
Vendor agrees to deliver project on a set date for a set fee.

SHARED RISK/REWARD
Vendor and user share a portion of new system costs and benefits. Vendor typically charges a higher rate.

VALUE-BASED
Vendor collects fees only after system is done and delivering benefits.

JOINT VENTURES/ALLIANCES
Vendor and user become business partners, sharing system costs and benefits.

Apps Keep Navy Up to Speed

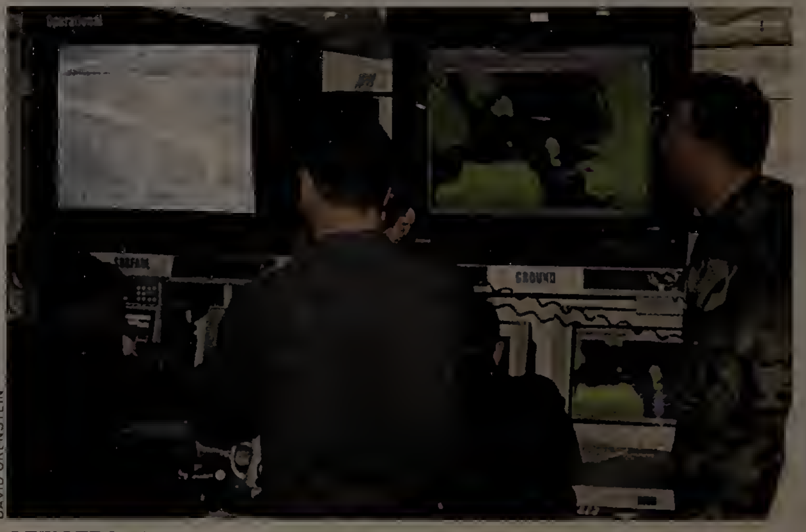
Off-the-shelf tools lend a business edge

BY DAVID ORENSTEIN

IT applications designed to support humanitarian and battle operations will be part of future U.S. Navy and Marine Corps missions. That's because providing humanitarian aid and conducting counterterrorism require the Navy to be more nimble than it has been in the past, said Navy Lt. Cmdr. Dan Shanower.

And it's standard off-the-shelf software that's giving the Navy that needed speed.

Among the applications the Navy has tested is a Notes-based system that links battlefield medical stations, Navy hospitals and civilian-aid organizations. The Navy and Marines also tested a system that gives commanders a near-real-time view of battlefield data. Subnotebooks are used in the field.



OFFICERS ABOARD the U.S.S. *Coronado* monitor mock operations

DAVID ORENSTEIN

The impetus for the systems? Acts of Congress that streamlined military procurement rules and standardized Navy systems starting in 1994 and 1996, said Mark Nissen, an assistant professor at the Navy Postgraduate College in Monterey, Calif.

The Navy's mission: to "do business more like business does," Nissen said. ◗

Special Advertising Supplement

April 26, 1999

Internet commerce makes business-critical reliability a necessity

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Introduction by
IDC
INTERNATIONAL DATA CORPORATION

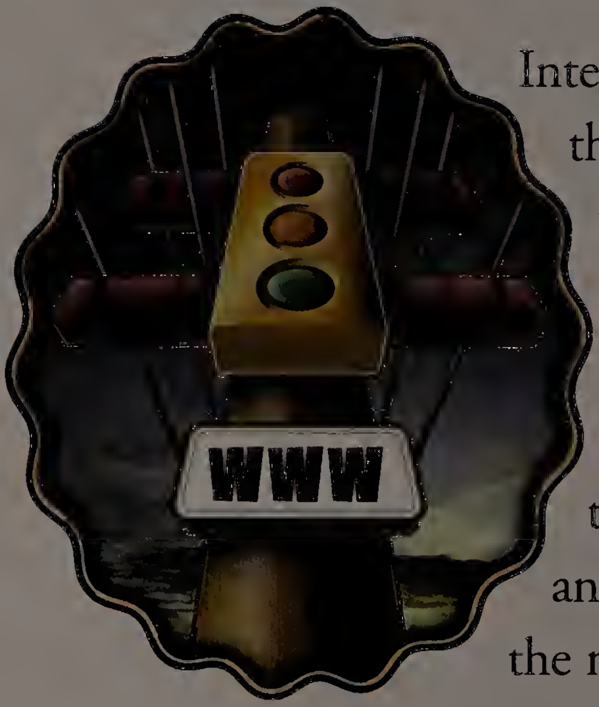
COMPUTERWORLD
Enterprise Business Solutions

by Mary Wardley and Albert Pang
International Data Corp.

The rules have changed: Internet-enabling enterprise applications

▶ The World Wide Web and the Internet have indelibly changed how businesses present themselves and how they communicate with their customers. Proof of this is in the latest IDC Global IT Survey, which found that 84% of U.S. companies with more than 500 employees have websites and that 78% of all U.S. companies offer detailed product information on their home pages.

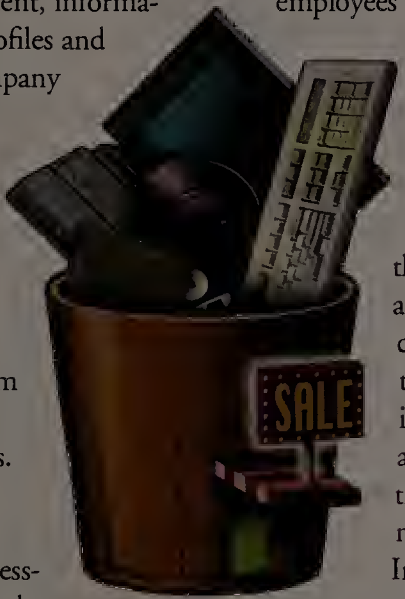
But perhaps the biggest change the Internet has had on business is seen in the way that the Web has evolved from an information-only vehicle to something much more: a vital component in the commerce chain. In IDC's Global IT Survey, 17% of the companies responding said they made sales transactions available on their sites last year, and that percentage is expected to soar over the next few years.



The explosion in the popularity of the World Wide Web has been driven by the advent of the browser. Browser technology has given users unprecedented access to common information, to the point that many employees with PCs now spend the greater part of their day in their browser applications.

As the Internet's role has evolved, so has the way content is presented over the Web. At first, it was an accomplishment for a business just to have a URL and post a static Web page. But as soon as companies starting counting hits to their websites, they realized that users had little reason to revisit sites whose content remained unchanged. Soon the static content on most websites evolved into dynamic content.

The next round of website development focused on increasing the immediacy of interaction for the visitor, and included technologies such as updateable objects, quick screen redraw and engaging interfaces. Website development has now reached the "personal dynamic content" phase, and the ante has been upped even higher for companies competing on the Web, with vendors leveraging strategies such as personalized catalog content, information based on user profiles and data mined from company information.



What all this leads to is a need for ever faster response time on the Web. A Web user's needs are relatively simple: a faster modem and ever-increasing memory requirements. But Internet-enabled vendors need more. They need more processing power, in both hardware and software, on the back end to keep pace with the demand for on-the-fly dynamic Web page creation.

This demand is not easily met. The Internet-enabled vendor requires a combination of server processing power, the continuous availability of that processing power and the knowledge that their servers are scalable enough to handle not just today's demands, but tomorrow's as well.

Internet foundations

Many organizations are finding other uses for Internet technologies besides maintaining a website, including improving internal efficiencies through the use of an intranet. Web technology also offers an organization the ability to include its partners and suppliers in its internal processes through an extranet. Let's look at how two enterprises have made the Internet a linchpin in their competitive strategy.

National Airlines, a start-up that hopes to launch service this year from its Las Vegas hub, is dedicating itself to becoming the low-cost carrier in one of the fastest growing metropolitan areas in the world. Its strategy for unseating the other dominant carriers hinges on running leaner and meaner, which it plans to do using an entirely Web-based infrastructure. Not only will customers be able to access flight and weather information on the airline's website, but an intranet will allow its employees to bid on their schedules and tap into the database for loading baggage and handling aircraft maintenance information. National has also set up an extranet to link the airline to travel agents and casino operators, so it can carry out cross-promotional activities such as issuing electronic coupons and frequent flyer credits that can be redeemed in many venues.

In the past, running such an automated system would have required that National hire an army of programmers and engineers to run scores of legacy applications ranging from computer reservation systems to batch files for outside suppliers. But all the above-mentioned web-based developments, which will have consid-

▶ **The Internet-enabled vendor requires a combination of server processing power, the continuous availability of that processing power and the knowledge that their servers are scalable enough to handle not just today's demands, but tomorrow's as well.**

The business rules of an organization are another barrier to re-engineering applications. These rules are often found only in existing applications, intertwined in the spaghetti code as a result of years of refinement. To simply eject these applications is not possible.

erable impact on the new airline's ability to compete, are being implemented by National's four-person IT department and three outside contractors.

Another corporation exploiting the Internet is MasterCard International, which is in the process of launching a Web-based electronic procurement system for thousands of its employees. Its goal is to slash the average time required to fill a purchase order by 70% and to cut the cost of processing a purchase order from the current $125 down to $40.

Saving time and saving money are just two of the benefits of putting the Web to work for an enterprise. Perhaps more important, ultimately, is the ability to consolidate, process and retrieve data from a single location, which will result in more accurate reporting and forecasting. In the long term, this will result in a better competitive advantage for an Internet-enabled organization like MasterCard.

Web challenges

Every company faces challenges drawing the Web into a corporate strategy. Adapting internal applications to the Web for employees and for the inclusion of an organization's partners and suppliers is a much more demanding development task than creating a website. The initial reason for Internet-enabling enterprise applications (particularly packaged applications such as R/3 from SAP) was to create self-service applets that made it easier for users to access the many functions of an organization. Perhaps the most common of these applets is the self-service HR Web interface, which lets employees view and, in some cases, update their benefits information from anywhere in the world. But this Internet-enabling of enterprise applications consisted merely of "bolting" the software to the existing application; it required no change to the back-end system.

(More advanced is the new wrinkle of providing a user interface in the form of an enterprise portal, for access to application functions and to business information. This way, more users can benefit from existing investments in enterprise applications, reporting and data warehousing, with portal administration defining roles for managing the deployment of a more personalized user-oriented environment. However, this introduces the need for another server layer to support Web browser-based front ends.)

Internet-enabling applications may require more than welding two components together. Creating Web-centric applications often requires a rewrite of existing applications. Enterprises collect information about users over the Web, then combine this with other business information and external data to build models (offline) for defining customer segments. They then provide realtime access to these models when buyers visit the website. The ability to tap into that customer data represents true power for an enterprise. The example of market basket analysis is described on p. 5.)

Legacy data is only one barrier when reengineering existing applications to create Web-centric versions. An organization's business rules are a bigger issue. These rules are often found only in existing applications, intertwined in the spaghetti code due to years of refinement and development. To simply eject these applications is not possible. In fact, most organizations will be running dual processes for years to come.

Big e-commerce push

The enterprise impetus to harness the Web's potential for commerce may be the most galvanizing factor behind many application development projects today. At first glance, making money on the Internet sounds simple enough: Pay a local ISP several hundred dollars, then start selling on the Web. But does that simple strategy lead to a constant influx of new customers? IDC research suggests that an e-commerce company without a clear strategy for building a customer base is asking for trouble.

Acquiring online customers is expensive. Amazon.com pays America Online an average of 90 cents for each visitor referred by AOL. But that does not mean these visitors will actually buy products from Amazon. And if they do buy once, will they come back? And if a satisfied online customer returns to check out the realtime status of, say, a loan application, how easy is it for the electronic merchant to cross- or upsell the customer other products?

Market basket data feeds warehouses

Market basket information, derived from point-of-sale data tagged with a customer's ID, is generating huge volumes of data that a vendor can use to generate more sales. It is also creating exponentially larger data stores, since, for each item purchased, an additional record is created each time a user clicks the mouse and each time a new ad is placed in front of a user. This, coupled with the fact that retail hours on the Web are 24 hours a day, seven days a week, guarantees that Internet-enabled vendors will be feeding giant data warehouses. This will require either huge investments in servers and storage, or the alternative of subscribing to a service (such as Engage or MatchLogic) that consolidates the data and provides access to the data warehouse and the models for a fee.

Unexpected problems

Every company that has deployed e-commerce solutions has encountered unanticipated levels of complexity, bandwidth limitations and scalability problems. Often, the limitations and demands of the system became apparent only as they moved into full production. For instance, companies assumed that static Web pages would be fine for online sales, but quickly realized that realtime inventory and dynamic Web pages were required. Customer expectation levels have skyrocketed. Instantaneous response is now mandated. In an age of realtime communication, the difference between completing an online order in three seconds vs. 30 seconds could mean the rise or fall of an e-commerce company.

Today, the key differentiator among e-commerce sites is how well they handle customer service and support. Extending one's business to the Internet may in fact be a no-lose proposition. But if that e-commerce site cannot provide fast e-mail responses, easy-to-follow customer self-help and links to other customer-relationship management tools like call centers and IP telephony, then no matter how good the product or company is, the site could go down in flames.

Worse yet is a site that cannot be accessed because its servers are down. All the demands for immediacy are put on the front ends of e-commerce systems, but it is the back-end integration that delivers true operating efficiencies. These critical back-end systems cannot afford the need to reboot. They must be up every second of the day.

IDC has defined three levels of high-availability solutions, the highest of which—the 99.999% availability level—is marked by fault tolerance. At this level, if a processing component fails, there is no interruption of work, no lost transactions and no degradation of performance. This uppermost level of availability was once the province of high-volume OLTP applications, such as airline reservations, financial investing and telecommunications. Today it applies to e-commerce as well.

For Internet-enabled e-commerce applications to succeed requires a particular infrastructure, one that is built around hardware redundancy and enabling software, which includes an operating environment modified for high availability as well as nonstop middleware. This infrastructure is not achievable on every platform.

Because organizations' back-end systems were built for lower customer demands, natural limits were built in. There were monitors in the form of customer service representatives. But human beings are only capable of processing *x* number of customer inquiries per hour, so an organization's total processing ability was based on the total number of customer service reps.

Organizations that have linked existing back-end systems to a Web-based customer service program have run into a firehose effect. They can now service a much greater volume of inquiries. On high-volume days in the non-Web world, batch processes run overnight, allowing companies to catch up. In the 24x7 world of the Web, there is no overnight, no offline, no time to catch up if one falls behind.

Web-based e-commerce promises global connectivity and a global selling market. But there are obstacles: the worldwide infrastructure, regional mores toward buying and selling, local language support, the need for dynamic multi-lingual Web pages, tax law compliance and currency conversions. Despite these, IDC forecasts that by 2003, about half of all goods and services sold online will be generated outside the U.S. E-commerce will clearly offer significant advantages for those companies that challenge conventional thinking by capitalizing on the Web.

About the authors

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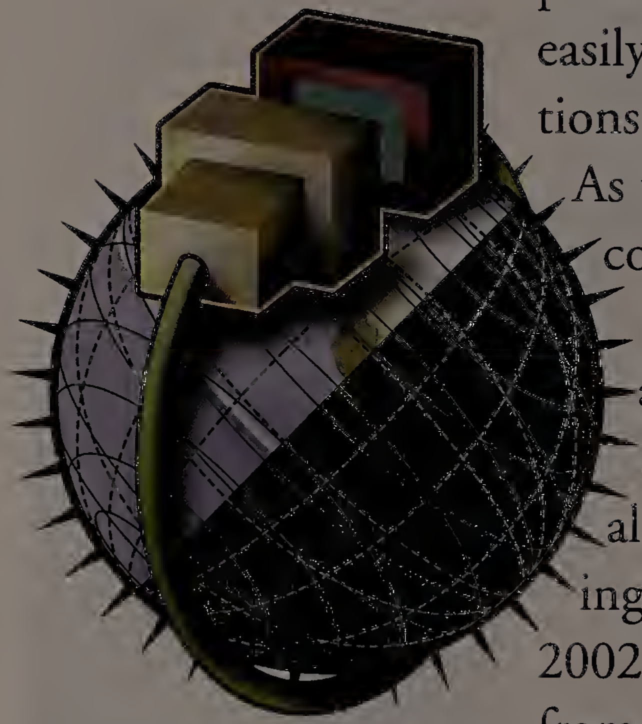
Compaq wants your Internet business

by Emily Kay

When the payment center of a major bank needed new ways of generating revenue and providing customers with additional payment channels, it knew it had to move aggressively into electronic commerce. The institution had to be able to offer customers secure telephone and Internet-enabled banking solutions.

Today, *NonStop® Himalaya* servers from Compaq Computer Corporation are proving integral to the institution's ability to offer such solutions. The payment center selected a *NonStop Himalaya* server for its phone-based billing system "because it can easily scale up to a high number of transactions," says the bank's IT director.



As the bank realized, the potential for e-commerce is vast. In the year 2003, 500 million people will have Internet access, according to market research firm International Data Corporation. IDC also predicts that corporate Internet spending in the U.S. will reach $203 billion by 2002, while online business revenues will soar from $1 billion in 1997 to $30 billion by 2001.

No wonder global enterprises are increasingly using Web technology to create intranets for employees, extranets for business partners and suppliers, and Internet applications for consumers to access applications and data residing on servers inside the corporation. For Internet-enabled enterprises like cargo shipper TradeVision, travel agency Mark Travel Corp. and Canadian Imperial Bank of Canada (CIBC), system reliability, availability, scalability and manageability are not just buzzwords; they are necessities.Turning to the comprehensive Internet-enabled strategy, based on *NonStop Himalaya* servers, offered by Compaq, is helping companies like these to:

- Increase revenue by providing a 24x7 global channel for anytime/anywhere purchases of products and services. Compaq, for example, has been able to generate more than $1 million per day in Web-based sales in under six months of operation.
- Reduce processing costs for credit card applications and software development and maintenance costs, as well as eliminate some shipping and fulfillment costs. In some firms, Internet-enabled order management applications can cut the cost of processing orders from $8-$25 per order to 3 cents to $1, according to market researcher Giga Information Group.
- Improve relationships with customers and suppliers. Customers can now order goods, check account balances, make reservations and update contact data from the Web sites of their suppliers. Suppliers go to customer sites to retrieve purchase orders, send invoices and deliver advance shipment notices.

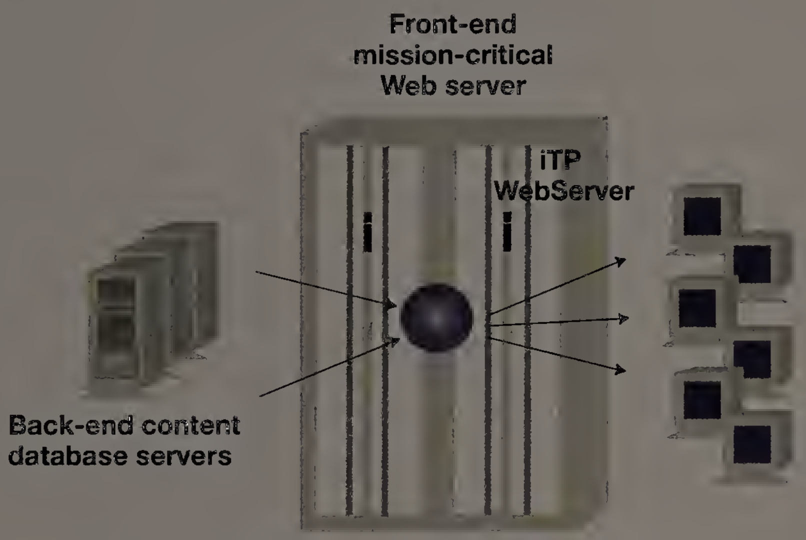
Companies that are candidates for Internet-enabling their business generally fall into two categories: those whose existing Internet installation has reached capacity, and those with a legacy implementation that needs to be Internet-enabled for new user support.

In the first category are the Whitbread yacht race, which uses a *NonStop Himalaya* server as a front-end Internet server accessing a series of back-end Windows NT content servers, and TradeVision, which uses a *NonStop Himalaya* as a robust back-end database server front-ended with UNIX® or Windows NT® Server-based Internet servers. TradeVision uses *Compaq ProLiant* and Microsoft Internet Information Server (IIS) front-ends to a *NonStop Himalaya* server.

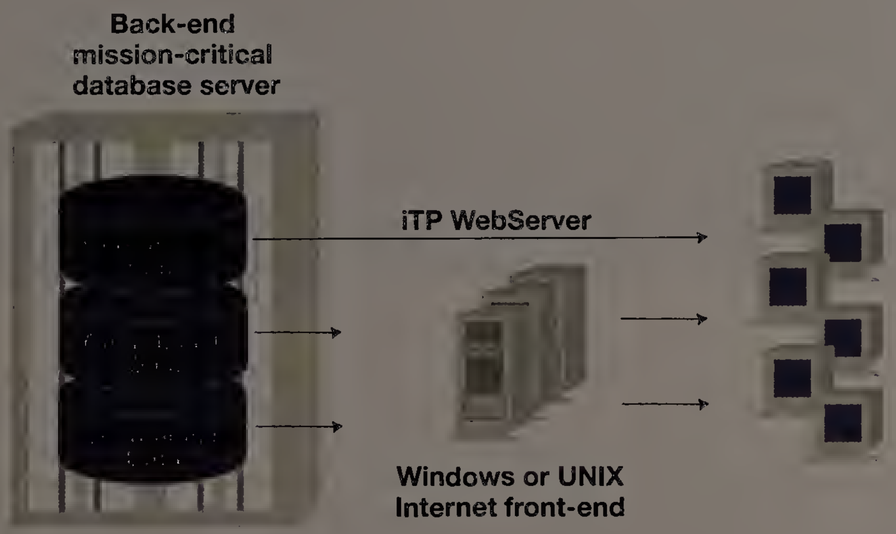
For the second category—companies Internet-enabling a legacy implementation—the *NonStop Himalaya* server works as an Internet-enabled server. Compaq supports all the common standards for Internet-enabling systems, such as CORBA, Java and COM, and for universal data access OLE DB, ODBC and JDBC. In fact, some *NonStop Himalaya* customers have Internet-enabled a mission-critical application in less than one hour.

Compaq believes that organizations must operate Web applications using existing infrastructure. "You want to Internet-enable what you have," says

Two ways to Internet-enable a business


Front-end mission-critical Web server
iTP WebServer
Back-end content database servers

The Whitbread yacht race uses a *NonStop Himalaya* server as a front-end server accessing a series of back-end Windows NT content servers.


Back-end mission-critical database server
iTP WebServer
Windows or UNIX Internet front-end

TradeVision uses a *NonStop Himalaya* as a robust back-end database server front-ended with UNIX or Windows NT Server-based Internet servers.

Business goals for Internet-enablement

Business Goal	Value of Web
[illegible]	• [illegible] • [illegible] • [illegible]
Enhancing relationships	• Customizes customer's or employee's experience • Provides real-time information to customers • Recommends new products based on customer's purchase history • "Pushes" critical information to individual employees, depending on the individual's job requirements
Reducing costs	• Reduces costs associated with developing and maintaining client software, and with license fees • Reduces inventory costs • Eliminates shipping costs and reduces fulfillment costs for digital products, such as software or music • Eliminates middlemen • Reduces processing costs for applications—for example, credit cards or loans • Can eliminate requirements to support older network protocols, such as SNA, especially for cross-domain access to Himalaya applications

Source: Compaq Computer Corp.

Customers Internet-enable their applications because it is good business. Compaq has been able to move more than $350 million in revenue from alternative ordering mechanisms to an Internet solution in less than six months.

Bob Sawyer, a marketing manager in Compaq's Enterprise Computing Group. "To junk what you have and start over from scratch is not a smart idea." In keeping with that philosophy, Compaq has made *Himalaya* fit into a variety of technical approaches that corporations can use to Internet-enable their applications.

The basic approach, in which the customer employs a *Himalaya* server for purposes other than its scalability and availability, involves the delivery of static data such as documentation, HR forms and product brochures. In a more dynamic environment, *Himalaya* servers can provide users with access to realtime information such as their bank account balance. Some users even access the servers to purchase goods, write checks or move funds online.

Perhaps the most radical way in which *Himalaya* servers enhance business is by bolstering a vendor's relationships with its customers. By providing customers with services beyond what they have come to expect from vendors, Web applications can lead to a more personalized business connection.

Phased approach

To what level an organization elects to Internet-enable its applications depends on its business goals and corporate resources. To take immediate advantage of Internet technologies without spending a fortune, Compaq suggests a phased approach to placing applications on the Web.

According to Sawyer, the lowest-risk and fastest method of Internet-enabling applications may be terminal emulation. Also called screen scraping, this method, which affords quick returns on a 15-minute Java™ programming task, provides simple browser-based access to legacy applications and requires no application interface or function changes. Organizations can use this procedure to deliver static data such as an online catalog.

The main advantages to this approach are lower costs for software distribution, communications, license fees and network management. Downsides? An unimproved user interface, and the fact that emulation from within a browser does not provide capabilities available from a full-featured emulator.

A Web application can grow to include online ordering, access to changing prices and product availability, as well as features that personalize customer service. The next step in Web applications would be to provide an HTML interface to existing applications and deliver them via HTTP. (HTML and HTTP—the most common Web-based language and protocol, respectively—are sufficient for Web applications that consist of one or two simple querying interactions.)

This approach, which also offers

quick returns with little outlay beyond writing code and training developers to use the development tools, adds a GUI on top of existing terminal emulation applications. Benefits include increased productivity from an improved user interface, low-cost browser access to applications, and no ongoing costs for client maintenance.

For instance, in late 1997 the Mark Travel Corp. hired a website provider to turn its existing *NonStop Himalaya* servers into a system that would allow consumers to do their own travel booking on the Internet. The system, which consists of a back-end booking engine which is interfaced to a front-end *Compaq ProLiant* server, allows users to not only get travel descriptions from the Mark Travel website, but also to select their destinations, book their hotels and pay for it all 24 hours a day.

The next phase of Internet-enabling *Himalaya* applications involves rewriting application interfaces for compatibility with Internet technologies such as hyperlinking and embedded Java or ActiveX® controls. ActiveX is Microsoft's approach to simplifying the creation, integration and reuse of software components over the Internet. This approach requires more time and money, but makes the GUI more intuitive and feature-rich, which reduces human errors and raises productivity.

For instance, to integrate its ATM network with the Internet, CIBC worked with Compaq's services division on a pilot project to devise an HTML interface and back-end links to its e-commerce partners. The project not only allowed customers to transact banking business at CIBC's ATM or via the Web, it also allowed them to order theater tickets and other non-banking products as well. CIBC runs *Himalaya* as well as other Compaq servers behind its ATMs.

Companies with more resources may opt for reengineering their applications entirely to change the way their businesses operate. Businesses that require this type of effort involve session-oriented protocols such as the CORBA standard Internet Inter-ORB Protocol (IIOP) or Java session protocols. A distributed-object architecture, CORBA supports the ability of objects to interoperate across networks, independent of the programming language. This saves time, boosts programmer productivity and simplifies complex development projects.

Organizations expending this level of effort tend to deal with highly interactive transactions such as stock trading applications. Under SEC regulations, for example, stock trading programs must notify a trader that a transaction went through or that an error has derailed the response. Compaq points out that less robust approaches like HTTP cannot discern such node or communications line breakdowns,

E-commerce magnifies security concerns

Security is critical for all business transactions, but e-commerce magnifies the concern for organizations whose customers and business partners require access to data residing on corporate servers.

When a Scandinavian bank began allowing its customers to pay bills via the Internet in 1996, upgrading its security measures became a priority. So the bank chose a *NonStop Himalaya* system to run the bill payment application and SSL-compliant *iTP Secure WebServer* software as the Internet front end. A *Himalaya* server's *NonStop Kernel* operating system guards against security breaches such as unauthorized access and data manipulation, as well as viruses.

Member banks using this Internet-enabled *Himalaya* application have cut processing and branch traffic and have eliminated manual handling of checks. Customers are now able to bank and access current account statements anytime by phone or the Internet.

Half of the bank's 340 million annual transactions are now performed electronically. A bank official said the *iTP WebServer* system "will be our core system for building new e-commerce services."

Compaq is also working with the bank on a pilot program to broaden the use of the SET Secure Electronic Transaction™ (SET)™ protocol for secure Web-based credit card transactions. Using the *Compaq iTP Payment Solution* product suite, which implements the SET protocol, the bank in 1998 deployed a six-month pilot involving three major banks, two major credit card companies, 6,000 cardholders and 30 retailers. Under SET, the bank expects to be able to collect and authorize transactions from any type of electronic channel.

The SET solution running on Compaq's reliable and scalable *iTP Payment Solution* technology and *NonStop Himalaya* servers enables the bank to handle unpredictable and potentially enormous e-commerce traffic. "The *Himalaya* platform is the first brick in our vision for Internet transactions and e-commerce," says the official.

Compaq is also working with a Swiss bank and card payment processor to deploy the first fully operational SET service in Europe. The *iTP Payment Solution* supports SET payments from Internet shoppers using the Swiss Eurocard MasterCard to Swiss Internet vendors. A *NonStop Himalaya* server links the Web with existing authorization systems for authorization and clearing of card payments. The *iTP Payment Solution* runs on a Windows NT platform.

while session-aware protocols like IIOP can detect when a communications network malfunction occurs. That would enable a trader to complete the last interaction in a transaction before the developer updates the database.

Sophisticated Internet-enabled applications such as these are perfectly suited for *Himalaya* servers operating in a multi-platform environment. A typical example involves developers deploying critical server functionality on *Himalaya* servers supporting a front end of *Compaq ProLiant* servers based on Windows NT Server. The *ProLiant* server requires more programming but supports more popular Web servers such as Microsoft's IIS.

The primary advantage of implementing Web server software on a *Himalaya* server may be ease of integration, since developers need only build an interface. Sawyer notes that the Web infrastructure for the Whitbread yacht race involved transaction processing on a *Himalaya* server running Tantau (formerly Tektonic) Application Server software, with videoconferencing operating on a Windows NT Server system.

Reengineering requires a substantial expenditure of development resources. But one benefit is improved customer service, which for TradeVision, a computerized cargo-shipment firm, translates into a huge competitive advantage. TradeVision was created in 1992 by the Smart Group, a subsidiary of Scandinavian Airline System, to transmit electronic data interchange (EDI) messages between freight forwarders and airline companies. The *NonStop Himalaya* servers have enabled TradeVision to augment the system to include communications about cargo shipments via the Internet. This ability, says TradeVision, is helping annual sales grow more than 30%.

A *Himalaya* S7000 server runs the core tracking application, which is tied via middleware to the Web interface running on *ProLiant* servers using Microsoft IIS. The combination supports TradeVision's need to implement standardized applications quickly on a highly reliable architecture. "*NonStop Himalaya* servers have given us the opportunity to grow globally with a service other firms don't offer," says Per Hansson, TradeVision's IT manager.

Web requires total availability

Companies that extend mission-critical applications to the Web require 100% computer and network availability. For Web-based companies, even a 0.1% downtime translates into 500 minutes of outage annually. In today's global, online economy, which demands systems that provide 24-hour computing seven days a week, 365 days a year, a corporation loses $10,000 for every minute that an e-commerce application is down, and $7,000 per minute of outage for an Internet banking application, according to the Standish Group, a research advisory firm in Dennis, Mass.

This economic reality is why the largest banking, financial services and telecommunications companies, who cannot afford a moment of downtime for their OLTP-intensive applications, run *NonStop Himalaya* servers. *Himalaya* systems manage 90% of all securities transactions, 66% of all credit card transactions and 80% of all ATM transactions. Some 48 of the top 50 banks in North America and Europe, and 18 of the top 25 banks in the Asia-Pacific region, operate *NonStop Himalaya* systems.

Today, "availability, scalability and manageability" is fast becoming the mantra for companies whose applications serve a global customer base. For them, there's no such thing as off hours for intended or unintended downtime. That's why so many of them use *NonStop Himalaya* as the infrastructure for their Internet systems.

Organizations with business-critical Internet-based implementations also require server solutions that can scale to meet the not-always-foreseeable growth of their Web applications. *Himalaya* servers can accommodate the increases in numbers of users, transactions per user, and transaction bandwidth that Web applications typically undergo.

Best of Both strategy

As the Internet emerges as a critical enterprise component, Compaq has been working to integrate *NonStop Himalaya* and Microsoft Windows NT Server technologies in what it calls its NonStop Best of Both strategy. This approach combines the continuous availability and scalability of *Himalaya* servers with the economy, openness and clustering software of Windows NT Server's operating environment.

Best of Both helps *Himalaya* server users maximize their current investments by allowing them to include Windows NT in the development of Web-based applications. For example, the *ServerNet* interconnect technology which Compaq uses to develop Windows NT Server clusters originates from the high-speed redundant routing technology of *NonStop Himalaya* servers. *Himalaya* architecture is also the basis for Microsoft Cluster Server software, which lets *ProLiant* servers operate as a Windows NT Server cluster.

The NonStop Best of Both strategy helps *Himalaya* server users further

TIP bridges interoperability gap

One step in bridging the interoperability gap has been Compaq's work with Microsoft on the Transaction Internet Protocol. TIP is a heterogeneous two-phase commit protocol that ensures the integrity and security of transactions over the Internet or other multi-platform environments. TIP simplifies transaction execution over multiple platforms, a common occurrence with Internet-based transactions. The TIP proposal from Compaq and Microsoft has been published by the Internet Engineering Task Force as a Proposed Standard Request for Comments (RFC).

leverage their investments through the *NonStop Himalaya* middleware layer. This layer enables application designers and developers to create multi-tier applications using a Windows NT client to a *NonStop Himalaya* server. Each component participates in a peer relationship by distributing client and server functions between them.

Compaq NonStop Software middleware and development tools enable the development and management of applications on the Internet as well as in client-server architectures. This means developers can write an application once and launch it on different platforms, doing away with "the need for (and cost of) redundant development and maintenance efforts," says Wayne Kernochan, senior VP of platforms for Aberdeen Group Inc., a consulting and market research firm.

The NonStop architecture is what assures 100% uptime for Internet-based applications. The *NonStop Software* suite of platform-independent software supports applications requiring high availability, scalability and simplified manageability. Designed for business intelligence and transaction processing solutions, the software also includes industry-standard APIs like BEA Systems' TUXEDO® and ODBC, and supports Java and CORBA application architectures.

In addition, *Compaq NonStop Transaction Server for Java* software architecture lets users deploy new or existing Java applications directly on *NonStop Himalaya* servers. This allows organizations to quickly Internet-enable applications.

To be sure, CORBA and Java support on *NonStop Himalaya*, Distributed Component Object Model (DCOM) on Windows NT Server, and *NonStop TUXEDO* on both platforms enable companies to develop a wide range of applications that Compaq combines under its umbrella.

iTP solutions include a variety of methods to guarantee secure Internet-enabled business applications. One approach—*Compaq iTP WebServer*—enables high-volume transaction processing by processing thousands of concurrent queries from Web users through a back-end database server. *Compaq iTP Secure WebServer* provides more security through support of Netscape Secure Sockets Layer (SSL) Version 3.0's encryption and server authentication capabilities.

One-stop corporate shopping

Compaq supplies one-stop shopping for corporate enterprise computing and provides a comprehensive solution for companies that want to deploy fault-tolerant Internet computing. Its product line extends from portable and desktop computers to the UNIX system, and also includes *ProLiant, Compaq Alpha* servers and high-availability *NonStop Himalaya* servers, Fibre Channel-based storage products and *Compaq ServerNet* interconnects. The strategy also includes tight integration with the Microsoft Windows NT (and later Windows 2000) operating systems. In addition, its services organization now totals 27,500 consultants, and Compaq expects to add 5,000 more in 1999.

Currently, Compaq is battling companies such as IBM and Sun Microsystems in the fiercely competitive marketplace for Internet offerings. But the rapidly growing market for e-commerce products and services should provide room for all of these firms, says Albert Pang, e-commerce software research manager for IDC.

"There's a lot of demand for heavy-duty hardware out there," says Pang. Compaq's "reputation for fault tolerance should continue to be the linchpin of their e-commerce strategy."

About the author

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▶ **"Availability, scalability and manageability" is fast becoming the mantra for companies whose applications serve a global customer base.**

"Internet-based computing is revolutionizing global commerce, and Compaq intends to strengthen its leadership in this revolution. NonStop technology is an important piece of Compaq's overall Internet strategy."

—John T. Rose
Senior Vice President and
Group General Manager
Enterprise Computing Group
Compaq Computer Corporation

"In many ways, NonStop Himalaya servers were Internet-ready long before the Internet itself. For 25 years, Compaq's NonStop developments have included the same advances that today are considered necessary for Internet-based commerce: continuous availability, massive scalability, and data integrity. This unique expertise and that of our partners will combine to help our customers take the final steps toward full Internet-readiness."

—Bill Heil
Vice President and General Manager
Tandem Division
Compaq Computer Corporation

COMPAQ
Better answers

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HEALTH STORE RIVALS TAKE DIFFERENT ROUTES ONLINE

One is on aggressive, mass-media mission; other aims to keep promotion costs low

BY DAVID ORENSTEIN

TWO RETAILERS of natural products — one of them traditional, the other purely online — are taking very different approaches to promoting similar sites to similar customers.

The online division at the $1.5 billion, Whole Foods Market Inc. natural foods chain in Austin, Texas, has a low-key campaign in store for enthusiasts of health food and diet supplements. But Mothernature.com, an online retailer of vitamins and supplements in Acton, Mass., is building a mass-media juggernaut fueled by millions of investor dollars.

Both sites offer customers a portal into the world of healthy living. Glossaries, articles and chat rooms are required because the sites are selling a lifestyle as well as products, said Donald Bellomy, an analyst at Aberdeen Group Inc. in Boston. Both sell natural vitamins and supplements, but Whole Foods sells a full line of groceries, and Mothernature sells private-label products.

The companies also might take the same approach to managing content and customization for their registered customers. Whole Foods uses StoryServer software from Vignette Inc. in Austin; Mothernature is considering replacing its custom-built system.

But despite their similarities, the sites' online goals are quite different.

Wholefoods.com isn't being driven by an initial public offering, said Wholefoods.com's marketing coordinator, John Fischer, so the company targets its advertising to readers of publications like *Vegetarian Life* rather than *The New York Times*. "A lot of [high-profile] ads are driven by a desire to be recognized by Wall Street," he said. "I'm interested in reaching our customers."

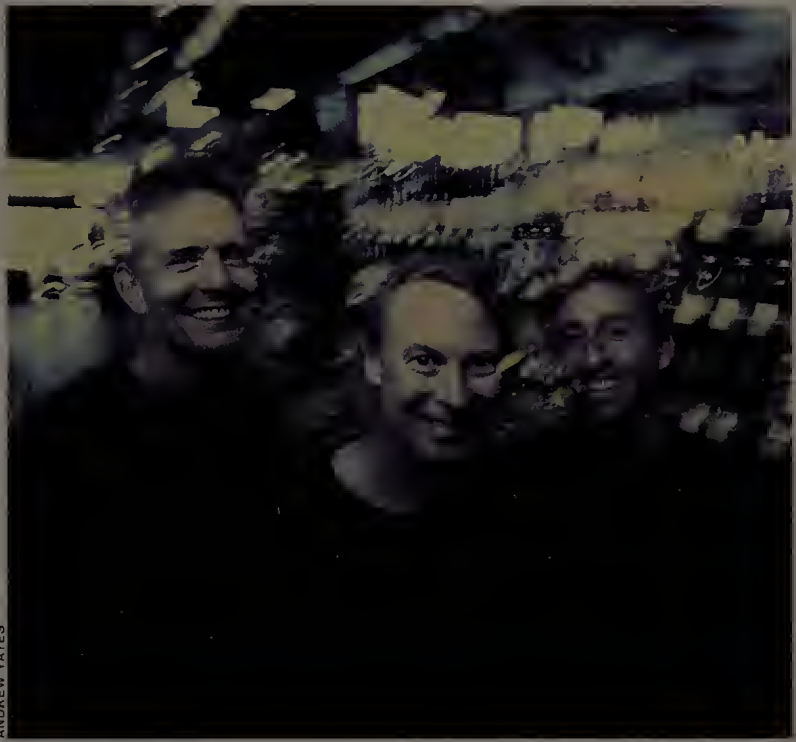
Word of Mouth

Wholefoods.com is spending most of its $3.8 million promotional budget on incentives for its store employees to encourage customers to register online, according to Evie Black Dykema, an analyst at Forrester Research Inc. in Cambridge, Mass. Wholefoods.com President Carl Morris said he expects the site to break even next year, with about $5 million in sales. Dykema agreed that the company will achieve profitability quickly by keeping its promotion costs low.

Rather than cannibalize sales at Whole Foods' physical stores, Morris said, a future version of its site will direct customers back to the stores by displaying online information about local stores, like special sales.

Mothernature CEO Michael Barach is taking a much more aggressive approach to marketing his site. That's because unlike Whole Foods, which views the Web as an extension of its stores, Mothernature's entire business plan is based on turning investor dollars into an electronic-commerce venture with high returns.

Since last summer, Mothernature has raised $23 million to promote its site and is pursuing more funds. The company just finished a radio, billboard and print advertising campaign in four major cities and will expand it to the 19 largest U.S. metro areas later this year. National television ads are scheduled for the fall.


ANDREW YATES

WHOLEFOODS.COM'S (from right) Dewayne Barry, Carl Morris and David Verba are placing their online focus on customers, not Wall Street

Mothernature.com wouldn't reveal its sales numbers, but expects the market for natural vitamins and supplements to grow 12% per year.

"There is a huge business to be built on the Web," Barach said. ◗

Insurers Push Quotes – But Not Sales – Online

Comparison shopping the best way for brokers to use Web

BY THOMAS HOFFMAN

"Nobody wakes up in the morning and says, 'Jeez, I've got to buy life insurance today,' " says Rich Carreau, a vice president at Computer Sciences Corp.'s (CSC) financial services practice in East Hartford, Conn.

Because life insurance is a "push" product that usually has to be sold in person, Carreau said that industry data indicates that less than 5% of all life insurance policies are sold online.

Even so, that hasn't stopped insurers of all types from developing online applications to help their brokers increase sales.

A case in point: In June, ChannelPoint Inc. in Colorado Springs will launch an "open Internet exchange" intended to provide the nation's 750,000 independent insurance brokers online access to compare a wide range of health and other insurance plans for corporate customers such as General Electric Co.

PRUDENTIAL'S Steve Ilnitzki says online quotes have led "to higher [sales] conversion rates"

ChannelPoint's Java-based, electronic marketplace is free for insurance brokers' use. Insurers will provide policy information to ChannelPoint and pay it "a very small percentage" of their premiums each time one of their products is sold through that channel, said Jeff Bork, senior vice president of marketing at ChannelPoint.

Bork said his company invested "north of seven figures" in IBM's AIX and Windows NT servers, firewalls and other supporting technologies.

One health maintenance organization that's bullish on ChannelPoint is Physicians Health Systems (PHS) in New York. The exchange "improves our brokers' ability to generate proposals more accurately and efficiently" and helps them sell more, said Tammy Tucker, senior vice president of sales at PHS.

Other insurers are educating customers online themselves. Prudential Insurance Company of America, for instance, recently used Haht Software Inc.'s development tools to build a term life-insurance quote engine at its Web site (*www.prudential.com*) that prospective customers can use to calculate rates.

Compared with other sources that generate sales leads to Prudential, the term-quote engine has led "to much higher [sales] conversion rates," said Steve Ilnitzki, the company's vice president of interactive marketing. ◗

SNAPSHOT

World Wide Wait

The average time, in seconds, to download a home page from over 40 business-related Web sites during business hours for the week of April 12:

TOP 5 BEST-PERFORMING WEB SITES	
Microsoft	3.06
The Wall Street Journal	3.35
Merrill Lynch	3.65
Federal Express	3.91
AltaVista	3.95

BEST AREAS TO WEB SURF	
Pittsburgh	3.96
Detroit	5.11
Minneapolis	5.46

WORST AREAS TO WEB SURF	
Tampa, Fla.	16.01
Phoenix	12.57
Cleveland	12.07

[illegible]

MERRILL TRAINS STAFF TO WORK AT HOME

Bucking trend, broker expands telecommuting with training to prepare employees for lifestyle change

BY MATT HAMBLEN

A RECENT REPORT says the rapid growth of telecommuting among IT people is slowing, but the number of telecommuters has tripled since 1997 at the Private Client Technology division at Merrill Lynch & Co. in Somerset, N.J.

Cromwell Foote Partners LLC, a research firm in Stamford, Conn., reported a slowdown in the trend of information technology workers adopting telecommuting [CW, April 12].

Of the 1,800 IT workers in the Merrill Lynch division, 300 telecommute at least two days each week, said Vice President Janice A. Miholics. That's up from 100 telecommuters in 1997. The program started in 1996.

"Our program gets a lot of interest . . . because it's very well-structured," Miholics said.

And productivity of Merrill Lynch's telecommuters ranges from 10% to 50% higher than nontelecommuters, according to company officials.

Merrill Lynch requires employees to submit written applications if they wish to telecommute. Telecommuting candidates then receive six hours of classroom training and must spend at least six days working in a training lab at the Somerset facility, which simulates a telecommuting environment. The company also offers ongoing support for telecommuters and conducts quarterly surveys of their success, according to Miholics and Chris Gioe, assistant vice president of the division.

"That lab is a good idea" because everyone assumes people know how to work alone when, in fact, people who want to telecommute might not understand what they're getting into, said David Foote, managing partner at Cromwell Foote.

"It takes a different mentality for telecommuting, and a company does have to educate people" not just in the use of remote access technology, but in the changes in lifestyle as well, said Fran Firth, an analyst at Cahners In-Stat Group in Newton, Mass.

Miholics said Merrill Lynch has spent generous amounts of time with managers to teach them to change management styles so that they judge telecommuters by agreed-upon objectives, instead of evaluating employees on how much time they spend at their desks.

For example, employees won't be judged as much on how many hours they work each week, but on whether they satisfactorily complete a task by an agreed-upon deadline.

"The biggest obstacle to telecommuting is never really the technology, but it is helping both managers and employees effectively acclimate to this work arrangement," Miholics said. For workers, it means learning that it's important to constantly update their managers, she said. ◗

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New Sears CIO Names Y2K Guru, Discusses Reduced Turnover

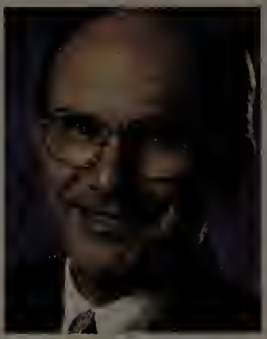
With more than 25 years of business and information technology experience, new Sears, Roebuck and Co. CIO **Jerry Miller** is taking a no-nonsense approach to year 2000 and is driving the nation's No. 2 retailer to become an e-commerce force.

Miller, 51, discussed his company's year 2000 project strategy with *Computerworld* senior editor Thomas Hoffman.

Q: What have you been focusing on first?

A: I made a couple of organizational changes up front and named Ken Dewitt [former vice president of financial systems] as vice president of year 2000. Ken is the type of person we need to ask the tough questions of both IT and the business, to be the devil's advocate.

Previously, we didn't have a single point of contact. Someone has to be 110% focused on this, and I just don't have the time.



JERRY MILLER: "Not having people work full-time on year 2000 helps" retain employees

Q: Has Sears had any experiences with year 2000 problems yet?

A: We've had a couple of minor glitches with minimal impact. For example, one manufacturer put new code into an [electronic data interchange] system, and we could not schedule advanced orders with them. It took a couple of days to iron that out.

We also put in a small system [designed to cut and send checks to Sears' suppliers] at the end of 1998. We tested to see if it would work from 1999 to 2000 . . . but we didn't check to see if it would work from 1998 to 1999. But we caught [the problem] immediately.

Q: How do you keep your IT staff from becoming burnt-out on Y2K work?

A: Forty percent of our staff [of 1,700 IT workers] is spending 20% to 80% of their time on year 2000. Few, if any, associates have spent 100% of their time on Y2K. We're redeploying those resources into support and new development activities.

We do lots of little things that [help reduce turnover]. We have pizza parties after we reach key milestones. We offer people flex schedules — to take Mondays or Fridays off.

The [turnover] rate [for IT employees] was 14% to 16% in the Chicagoland area. We're down to the 7% to 9% range. Not having people work full-time on year 2000 helps.

Q: How do you plan to attract customers to sears.com?

A: Customers will dictate what they want. We're not going to sell [products] at a discount on the Net. Just look at Amazon.com — you can buy books cheaper elsewhere, but [Amazon.com] is convenient. If we focus [our online sales strategy correctly], we can drive a lot [of sales]. ◗

Drucker: IT Hasn't Done Job

No one has influenced the practice of management during the past four decades more than author, teacher and consultant **Peter F. Drucker**. *Often called the father of modern management, he originated numerous concepts such as privatization, the knowledge worker and management by objectives.*

Information technology managers might wince at Drucker's assertion that they're little more than system custodians, which he says are the new millennium's equivalent of the plant manager.

Those and other thoughts on the future of IT are outlined in Drucker's latest book, Management Challenges for the 21st Century *(HarperBusiness, New York, 198 pages, $27.50, hardcover), which will appear in bookstores this week.*

In an interview with Computerworld *editor at large Gary H. Anthes, Drucker explains why he thinks IT managers have been "superstars" during the past 40 years — but have utterly failed to prepare corporate management for the next 40.*

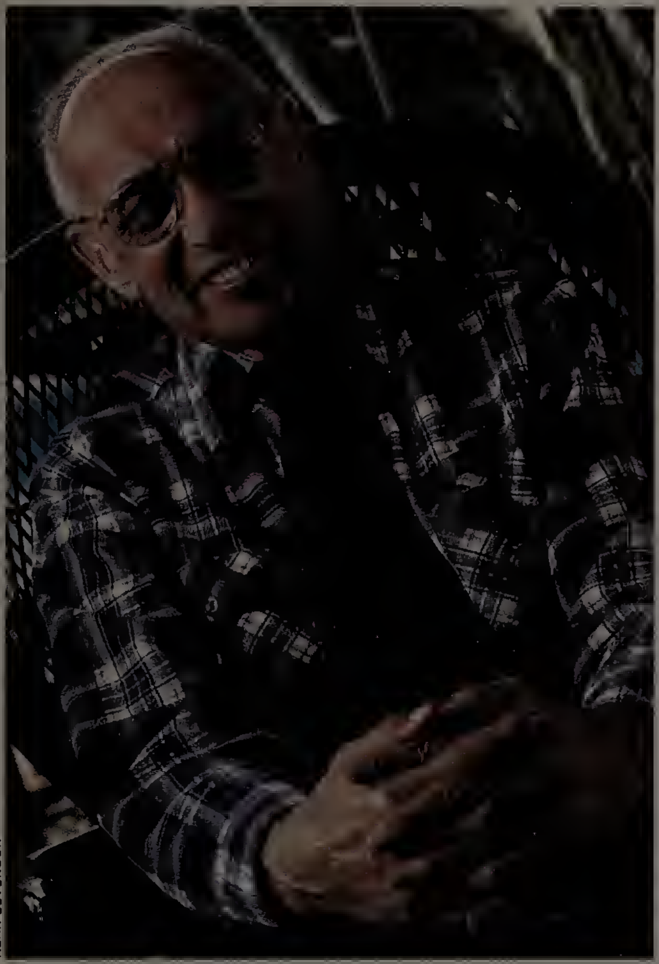
You seem unimpressed with the potential of IT to solve its problems in the 21st century. Is it overly enamored with technology? I am not unimpressed with the potential of technology. But I am very surprised that computer people pay no attention at all to where they have made the greatest impact. The greatest impact during the past 50 years has been on operations, not on management information.

Yesterday, I saw a tone-deaf piano tuner use a computer to tune a grand piano. He did exactly what piano tuners have done for 300 years, but the software did it. The same is true for tax returns, payroll and architectural drawings: The greatest impact is that traditional operations have been automated. A grand piano tuning used to take three hours; this one took 11 minutes.

Is it unrealistic to think IT might do more than automate operations? Not unrealistic, but so far, IT hasn't done it. The computer has contributed not one new thing that didn't exist before, except maybe in the military and in science. Maybe we are now at the point where new things can come out of the computer.

Such as the management information you say has been missing? For the first time, we are starting to get real information — but not out of the computer. It is coming out of new accounting concepts, either economic-chain accounting or activity-based accounting.

They use the computer, but in the way we use a typewriter. I'm not antitechnology. I'm only saying that IT people are so hypnotized by the technology they don't look for real results. Whenever I open a computer magazine, there are pages and pages about how to do things faster. How many people need that speed? Maybe a physicist who chases neutrons.


ALAN LEVENSON

WHO IS HE?

Peter F. Drucker, 89, is often called the father of modern management. He has written 28 books on management, economics, policy and history and received more than two dozen doctorate degrees from universities in six countries. He is a social science professor at Claremont Graduate School in Claremont, Calif.

What management information is missing? Information on the productivity of key resources. We have information on the productivity of manual workers and of materials — how much wire can you get out of a pound of copper, for example. We have practically no productivity information on knowledge, but we know we need it. Competence information is in its infancy. What are a company's core competencies? Which ones does it need? Are they improving or weakening? It's still a matter of judgment rather than measurement. Information on the allocation of scarce resources — capital and people — is also in its infancy. The military, when it appoints a high-ranking commander, asks, "What do we expect him to perform?" Three years later, when his term of duty is over, they check the actual results against expectations. So the military is beginning to allocate its scarcest resource on a rational basis. But in business, we don't do it.

How are we doing on capital-allocation information? Every company I know has an elaborate process for studying capital allocation, but not more than one or two among hundreds look three years later at whether that capital investment produced the promised results. In fact, most of them don't even ask the question, "What results do we expect?" The capital appropriation request is one of the less noble forms of writing crude fiction in order to get the money.

You say few executives have made much of an effort to define their information needs, instead delegating that to IT people, which you say hasn't worked well. But isn't there some way for IT and top management to work together on this effectively? Executives are just beginning to ask, "What information do I need?" Most of them still think the IT executive can tell them that. No; he or she can't. One thing IT people can do and must do is ask the question of the executive. But they don't, as a rule. They just deliver data. There are some exceptions, in some financial institutions, [in which] the IT people become part of management.

What's unique about those financial institutions? First, financial people came to the computer with the right mind-set because, basically, they think in data terms anyhow. Second, there's no product differentiation between one financial institution and another.

When you look at financial work, it consists of an unbelievably large number of uniform, repetitive transactions, which [is] ideal for IT. The only differentiation is customer service; today, that means your system must respond and anticipate. Citibank was a leader. Since the late 1960s, it saw that IT people had to be part of bank management. It took 10 years, but now they are totally integrated. The same is true of Merrill Lynch and A. G. Edwards, but they're still the exceptions.

You sound an alarm about the "collapsing birth rate in the developed world." You say that the productivity of knowledge workers will have to increase very rapidly, or we will become steadily poorer. What can you say specifically about computer knowledge workers? I think there's going to be no shortage of people who are computer literate. In this country, a very large percentage of the children are not only computer literate, but IT literate. My grandchildren not only know how to use a computer, they understand what it can do. ◗

You can contact Anthes at gary_anthes@computerworld.com.

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BRIEFS

Web Push at Sharper Image

The Sharper Image last week hired a director of global Internet marketing. The San Francisco-based retailer said Meredith C. Medland will implement multimillion-dollar marketing and promotional campaigns to increase e-commerce revenue, which was $5 million last year. Medland recently served as the National Sales Evangelist at the Interactive Media Department of the *Chicago Tribune Internet Edition.*

Bulgarian Railroad To Automate

Bulgarian Railways will automate its financial and freight operations systems in a $9 million deal with Computron Software Inc. in Rutherford, N.J., and U.K.-based systems integrator Sema Group, according to Computron. Funded by the World Bank, the initial contract is valued at $1.4 million for software and services. Computron said it has previously worked for Bulgarian Telecom and Polish Railways as well as other transportation companies.

Finance Site Expands

FinancialWeb.com Inc. last week said it acquired Daily-Stocks.com, a Web site that provides information about stocks and financial markets. FinancialWeb.com operates 18 financial information sites.

Net Shakes Up U.S. Business

E-commerce, while still in its infancy, is changing the face of business across 15 industries, from advertising to telecommunications services, according to a study released last week by Merrill Lynch & Co. in New York. Companies such as banks, brokerages and publishers – have already been "profoundly affected" by e-commerce, the 150-page study found.

NEW REPORTS

New Net Access

As the number of adults on the Internet increases, so does the number of users accessing it with handheld computers and other alternative devices, according to IntelliQuest Information Group Inc. in Austin, Texas.

According to a new IntelliQuest study, more than 83 million adults, or 40% of the U.S. population age 16 and older, use the Internet, up from 66 million in the same quarter last year. Of those, 3.7 million (4.5%) said they used a handheld computer for access and 3.1 million (3.7%) used a television set-top box or WebTV.

The study is part of the Worldwide Internet/Online Tracking Service. Annual subscriptions start at $25,000. Single summary reports are also available. *www.intelliquest.com*

NT Use Overblown

Media reports of Microsoft Corp. Windows NT's acceptance have overestimated where and when NT is being used, according to research from International Data Corp. (IDC) in Framingham, Mass.

In "Strategies for Windows NT in the Enterprise," IDC shows that Unix or Novell Inc.'s NetWare aren't being abandoned to make room for NT. Rather, firms often install NT to work alongside and support other systems.

The report costs $795. *www.idc.com*

JIM CHAMPY

Managing speed

THERE'S NO DEBATE about it: Everything is moving faster. Speed is the principal theme of Bill Gates' book, *Business @ the Speed of Thought*. "If the 1980s were about quality and the 1990s were about re-engineering, then the 2000s will be about velocity," Gates declares. He's right. The pursuit of quality and the redesign of business processes aren't going away, either. Those will also just happen more quickly. There will be an increase in the rate of change all around us — with industries, markets, businesses, processes and people all dancing as fast as they can.

I'm breathless already.

Gates argues that change is driven by the flow of digital information. I agree: The ubiquity of technology is both a cause and a potential response to the increasing speed of change. But, truth be told, no one really knows how to manage the accelerating pace of change either personally or within the business.

There are, however, a few approaches emerging.

Some suggest that managers must become more adaptive, arguing that business change won't slow down, so managers have to keep up. Managers must emulate long-distance runners, who build stamina by running a few more miles every day.

The problem is, people change their behaviors and develop new capabilities slowly. Besides, who wants to run a marathon every day?

Then there's the Gatesean point of view: Build a digital nervous system that will guide you through change by providing instant information for strategic thinking, customer interaction and operations. It's not a totally new idea, but his book develops it well. There is, after all, enough technology to make it work in most organizations.

The problem? Most organizations aren't so adaptive, and building and learning to manage through a new "nervous system" will take time. Many companies won't make it.

> *Many companies are too overstructured for a velocity-driven world.*

For a more radical approach, look to Tom Peters. He argues that companies should act like a Hollywood production company, forming for one film, dissolving, then reforming.

But most businesses can't act that way. You can't store people and assets in a warehouse like Hollywood props and wait for the next business-change blockbuster.

Enough discussion of what doesn't work. The following is my prescription for what does:

■ **Set personal limits.** More companies are operating around-the-clock. That's where the financial-services industry is going.

But not everyone has to be on call all the time. Restoring balance in your life by setting limits on what you're willing to do may be the only way to maintain the perspective required to respond intelligently to business change. Our bodies and minds weren't designed to always give what a business demands.

■ **Bulk up with extra capacity.** In theory, it's possible to design processes and systems that can respond to the next wave of business change, but I don't believe that's happening. Many of the huge enterprise resource planning projects being undertaken by companies might just be the next block of concrete that drags them under.

Gates' vision of a corporate nervous system is correct. Someone just has to show us how to build it. In the meantime, you may want to build lots of overcapacity into new processes and systems. Also consider increasing your dependency on third-party service providers, especially in the area of logistics. That may give you room to respond to market changes and opportunities.

■ **Flatten and simplify your organizational structure.** It isn't a new idea, but many companies are too overstructured and bureaucratic for a velocity-driven world.

In the end, we all have to face and resolve the paradox of working faster and better. Sometimes, though, it pays to listen to the French, who say: "Slow down, I'm in a hurry." ◗

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. He can be reached at JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.

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THE FINAL HOURS

From lining up extra staff to preparing to deal with power outages, Y2K teams are making New Year's Eve plans now

By Kathleen Melymuka

MARK LUIENENBURG

PILLSBURY YEAR 2000 TEAM MEMBER NANCY MITCHELL: "You don't need every manager coming in. You want those who can interact with the applications to keep the business processes alive"

ZERO HOUR and D day are fast approaching — and the next wave of year 2000 planning is here. The preoccupation with coding and testing is giving way to talk of logistics, staffing, service surges, power-downs, SWAT teams and command centers. All are part of navigating the final, crucial steps to New Year's Eve.

Year 2000 event planning is all about the who, what, when, where and why in the weeks just before Jan. 1, 2000, the date-change weekend itself and the weeks immediately thereafter. "That's one of the things we're wrestling with," says Nancy Mitchell, senior business analyst and year 2000 team member at Pillsbury Co. in Minneapolis. "As we talk to other industry and business partners, most don't have a well-designed plan yet."

The following shows how some early plans are beginning to shape up:

Manning the Barricades

The command center will be the central nervous system on the big night, watching systems turn over and coordinating SWAT teams' firefighting efforts. Companies everywhere are grappling with some of the following questions: Who needs to be there physically? Who needs to be reachable? How will decisions be made? What happens if communications fail?

"We'll have Y2K team members, me, management, people from the data center, from hardware and software, systems engineers and programmer analysts on-site on Dec. 31 and Jan. 1," says Deborah Stagg, year 2000 project manager at San Diego Data Processing Corp., which provides information technology services to the city of San Diego. "We'll be watching the programs run, watching the machines roll over. We'll be the first line of defense if anything has a problem, and then we'll determine what to do."

At Pillsbury, a major challenge is to make sure the right people are in the right places — particularly in its geo-

Final Hours, page 56

THE FINAL HOURS

Continued from page 55

graphically dispersed manufacturing plants. "You don't need every manager coming in. You want those who can interact with the applications to keep the business processes alive," Mitchell says.

Many companies are planning to back up land lines with cellular phones and beepers in case there are communications problems. Even so, contingencies must be planned. "Everyone [needs to] know how to behave [and] whether they can talk to headquarters or not," she says.

Worldwide companies, like Equifax Inc. in Atlanta, will have a command center linked to regional teams around the globe. Each team will have first-line staff on duty and a second line ready to fill in, if necessary. Nearby hotel rooms have been booked for staff who will be on call overnight. A senior person in each region will be authorized to make decisions if communications with the global center fail.

One topic on every project manager's mind is what to do if Y2K causes problems that threaten employees' families. "That is a concern," says David Kelble, year 2000 project manager at convenience store chain Wawa Inc. in Wawa, Pa. "If my family is going to be in some danger, I'm not sure I'm going to be worried too much about working that day."

Project managers have been kicking around several ideas, including having several layers of understudies to fill in if key people have priorities at home; deploying mobile bands of troubleshooters to address domestic emergencies so that employees can work; and inviting family members to join employees at nearby hotels or corporate camp-ins.

Testing Contingencies

This year's third and fourth quarters will see lots of contingency drills. At Pillsbury, that means running drills at its manufacturing facilities — "very practical things it takes to keep a plant open," Mitchell says. For example, a drill might walk through calling in workers, obtaining extra security, checking on the availability of raw materials and packaging, arranging for unscheduled deliveries and working with carriers on ad hoc route changes.

Such drills are nothing new at Pillsbury, Mitchell says. "In the manufacturing world, everyone has scenarios because there may have been weather problems or labor unrest in the past," she says.

Some businesses are beefing up their customer service support, anticipating a surge in customer requests shortly before the date change. Financial institutions, for example, might be deluged with calls for account records in case of Y2K snafus.

Equifax, which expects such a surge, is also gearing up for a spike in internal customer service at the help desk level. Because some of Equifax's help desk services are outsourced, it's also working with service providers to be sure they're ready.

What About Logistics?

Because Y2K problems may also affect transportation, many project managers are setting up logistical contingencies beforehand. Kelble, who's supporting a chain of 500 stores along the East Coast, may strategically locate a fleet of service vans carrying spare parts for cash registers. Mitchell might position key people at Pillsbury's high-tech, high-profit and high-risk plants. One company with a diesel backup generator is planning to park a truck full of diesel fuel in its parking lot.

Mitchell also plans to have corporate cash on hand to grease the wheels of commerce, if needed. "If you anticipate trucks will be at a premium and you [may] have a transportation need outside of a contract, you may have to give the drivers cash," she says.

Although international companies are dealing with their share of Y2K logistical headaches, there's one area where they have an advantage — and project managers intend to exploit it. "We have business units around the world, so we can follow the millennium as it happens and get advance communications about good or bad things that occur," Mitchell says. That's assuming that communications don't fail.

Of course, New Year's is also part of the holiday season. But some people will have to forgo the festivities to watch the clock wind down at work, and many companies won't grant vacation time to key people. Tony Del Duca, vice president of logistics and manufacturing systems at Nabisco Inc. in East Hanover, N.J., has informed IT people that they're not going anywhere over the holidays. "We've suspended all IS vacations for all of December and all of January," he says. "No one can take leave unless there's a personal emergency."

Stagg is reviewing the city of San Diego's mainframe processing schedule for the two weeks before (because some programs project dates ahead) and after the date change and is alerting analysts who work on particular systems that they and their backups will be on call to troubleshoot when their systems run. Otherwise, IT leave requests will depend on whether backups can be found, she says.

Pillsbury plans to start working out Y2K staffing needs with the unions in its manufacturing plants early on. "We have time to plan. It all turns on open and honest communication, early planning and clear expectations," Mitchell says.

Power Down or Full Speed Ahead?

There has been a lot of discussion about the best systems strategy for the moment of the date rollover: Should you lighten the normal processing load, power down to a minimum, shut off the system and restart — or carry on as usual?

That decision involves more than systems. "Most of the things we've seen so far [indicate] it's better to turn systems off and turn them back up, but we don't yet know what that would do to our inventory positions," Del Duca says. "We have to work with sales and forecasting. We have to look at the up- and downside of all these things from a financial position. We haven't figured that all out yet."

Because shutting down and restarting systems can cause damage such as thermal fractures on disk drives, Rick Lessard says his preference is to leave systems running but process nothing. Lessard, senior vice president of technology at Equifax, says it will lessen the risk of losing data and enable the Y2K team to run test data through the system.

Mitchell's approach? Get as much processing as possible out of the way ahead of time. "We want to manage the calendar instead of letting events manage our work," she says. "For example, we might close the books for December early. We may run [payroll] early and get paychecks distributed."

But Stagg expects to go full steam into the millennium. "We've tested all the systems, and they work," she says. "We're going to just let 'em roll over."

After Midnight

As 2000 dawns, call centers, command centers and SWAT teams will swing into action in earnest. At Equifax, help desk staff will be trained to identify and solve certain Y2K problems while bumping more complex issues to a year 2000 command center.

The main purposes are "quick decisions and immediate action, so we don't slow down business processes if a problem is encountered," Lessard says.

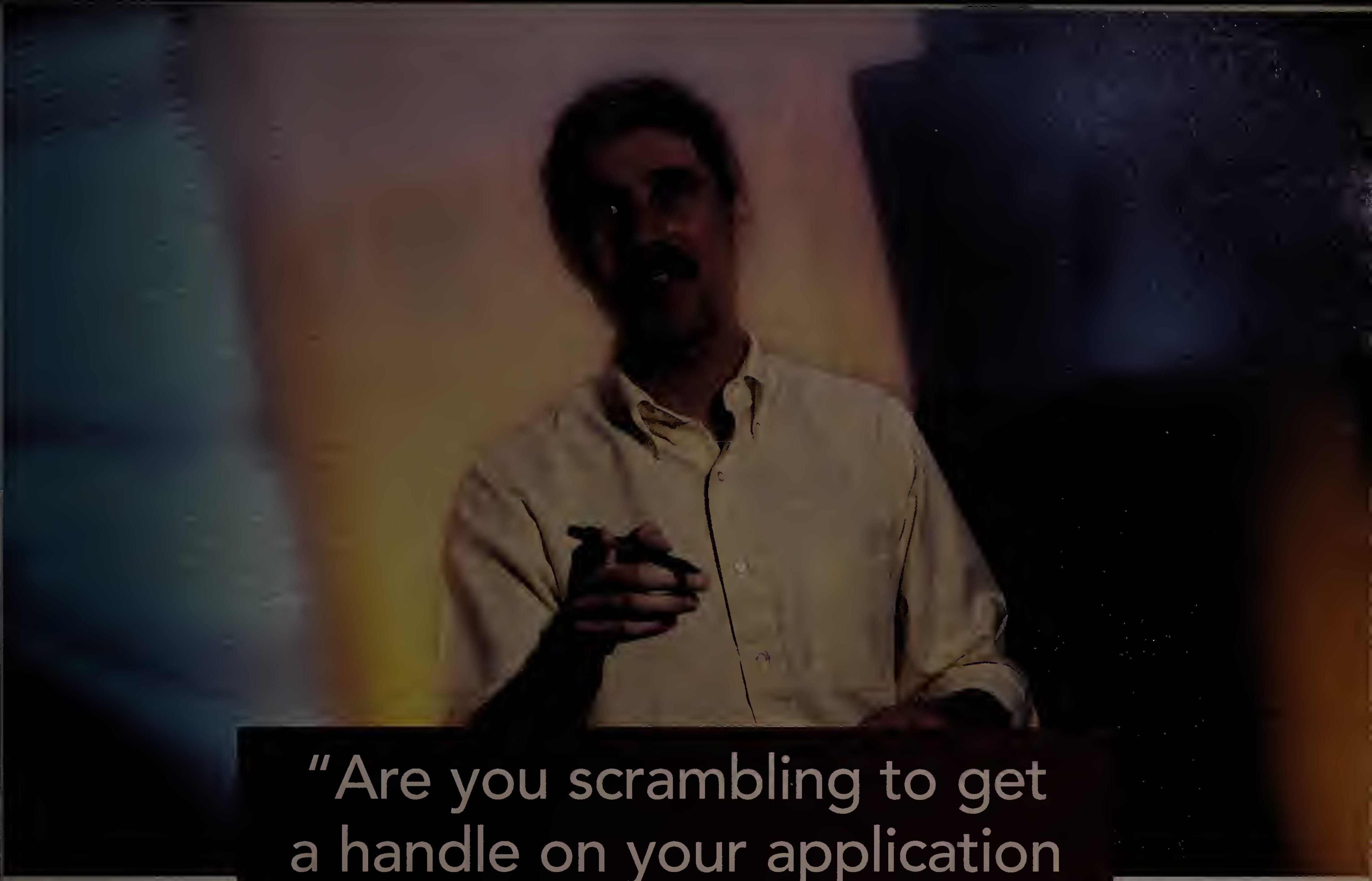
Pillsbury's SWAT teams will monitor data and reports and troubleshoot problems with PCs. "We'll be staying close to processes until we get back to normal," Mitchell says.

Stagg cautions that Jan. 1 won't be the only day that things go wrong. "We'll have teams standing by for several weeks. That first quarter will be pretty stressful, waiting and watching. In the second quarter, we'll probably start relaxing," she says. ◆

Melymuka is Computerworld's *senior editor, management. Contact her at kathleen_melymuka@computerworld.com.*

JOHN RAE

> We've suspended all IS vacations for all of December and all of January. No one can take leave unless there's a personal emergency.
>
> **TONY DEL DUCA, VICE PRESIDENT OF LOGISTICS AND MANUFACTURING SYSTEMS, NABISCO**



"Are you scrambling to get a handle on your application integration plan?"

Ross Altman, research director, GartnerGroup

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Maryfran Johnson, executive editor of Computerworld, will moderate a panel discussion during this conference.

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Consulting's Near-Death Experiences

CONSULTING OFFERS freedom, but with freedom comes risk and responsibility. Veteran consultants say there are common growing pains they all go through as they learn to manage their businesses. But then there are the BIG errors in judgment — the lethal mistakes that can be disastrous to your career.

With one foot in the grave, you've got "to make a commitment and stick with it," says Shuli Goodman, owner and principal of Seventh Generation Internet in San Francisco.

Here's how three thriving consultants found their way back from near-death career experiences.

By Leslie Goff

John Genzano

- *Genzano Software Consulting, West Chester, Pa.*
- *Also Southeast regional representative for the Independent Computer Consultants Association in St. Louis.*
- *Develops departmental systems for large corporations.*
- *Consulting for 14 years.*

FATAL MISTAKE: Failing to define customer expectations. Genzano was hired in 1987 to develop a mainframe-based data retrieval system for a manufacturer's sales department. The system would function roughly like a decision support system tied to a data warehouse today, delivering profit-and-loss statements sliced by product area, product line, sales region and other views. The client said fast response time was the key requirement.

Working under the MVS operating system on an IBM 4300 series computer, Genzano succeeded in getting the system to sum up and spit out data from 1 million records within 30 to 32 seconds. But it turned out the client's measure of success was 15 seconds. Genzano realized the client had never defined fast response time, and he had never asked. "I thought it was fabulous, but they didn't seem to think so," he recalls. "Fifteen seconds was unrealistic, but that didn't matter."

CONSEQUENCES: The client canceled the contract on the spot. After working on the project approximately eight months, Genzano was out on the street without a new client lined up and with nothing to show for his time. "They were not a reference, obviously," he explains. To this day, the job doesn't show up on his résumé.

LINGERING IMPACT: The agency that brokered the job never called again. "That was the third or fourth job I had gotten through them, and it turned out to be the last," Genzano says. Plus, it may have jeopardized his reputation with other agencies. "Word gets around."

LESSON LEARNED: Ask a lot of questions, and make sure you're on the same page. "Find out what is really important to the customer, and work out what they mean," he says.

SILVER LINING: Genzano's transition from working with brokers to seeking direct contracts was hastened.

"It was at about the same time that I had made a business decision to slow down my use of brokers," Genzano says. In the long run, that helped boost his rates.

CONSULTING'S COMMON MISTAKES

Feast or Famine:

You either have too many balls in the air at once or none. Shuli Goodman at Seventh Generation Internet says it's a lesson everyone learns the hard way. Don't get bogged down in the following never-ending cycle: contract in progress – contract over – begin marketing again. If you spend all your time on billable hours and none on managing your work flow, you will end up with significant downtime between jobs, desperately looking for the next gig. Think of a full week as 30 billable hours and 10 hours spent on marketing, says John Genzano at Genzano Software Consulting.

Ignorance of the Law:

Not knowing the tax, liability and intellectual property laws that apply to information technology consulting can make you vulnerable to signing contracts that will favor the client over your business. If you use a custom tool kit for developing applications, for example, make sure the contract specifies that the tool kit is your intellectual property, Genzano says. Stay informed, and get support from a good lawyer and a good accountant.

Overpricing or Underpricing Services:

Pricing is a double-edged sword. You want to offer a competitive rate, but not one that's so low it makes the client think your skills aren't valuable. "You need to project a certain image, and that's reflected in the price," says David Zimmer at American Eagle Group. "The client has an idea of the value of the skills they want." Finding the balance is one of consulting's great challenges. Network with colleagues, be aware of geographic variances in what the market will bear, and do your homework on clients and their needs.

Timidity in Negotiations:

Many consultants who are just starting out allow themselves to be manhandled by brokers. "Some brokers have ridiculous noncompete clauses or won't disclose the rates they are charging their clients," warns Tom Scott, owner of Tom Scott Consulting in Encinitas, Calif. Don't permit yourself to be in a powerless position. "The biggest thing you have going for you is that the broker can't make money if they can't place you," Scott says. By marketing in advance and keeping a cash reserve on hand, you are less dependent on brokers for work – and in a stronger negotiating position as a result.

Ignoring Your Gut:

Heed your instincts. If it looks like a loser, feels like a loser and smells like a loser, it probably is a loser. Genzano says he should have known he was in for a hard time when a client refused to disclose its annual sales revenue even when the job was to develop a system for the sales department. And Scott accepted a position with a startup software company even though he was concerned that it was underfunded. The result: He made about half the money over two years that he could have made consulting. *– Leslie Goff*

Shuli Goodman

- *Owner/principal, Seventh Generation Internet in San Francisco, a small Web site design and e-commerce firm with 12 employees.*
- *Specialty is project management and development methodology for online projects.*
- *Consulting for four years.*

FATAL MISTAKE: Trying to please a large, loyal client at the expense of her own best instincts. One of Goodman's best clients, a large publisher, hired her company to design a complex site with dynamically generated content, online registration and user log-in functions. But to save 20%, the client insisted on using its own project manager. Goodman was hesitant, but she wanted to keep a loyal customer happy.

"I walked into a maze of their ineptitude and sent three of my people into it," Goodman says. "If I had been involved on a day-to-day [basis] and had understood all the requirements of the project, I would have seen the red flags sooner."

In the absence of any central project management, by the time the customer was halfway through its resources, the development was only 25% complete. And the contract was a fixed bid.

CONSEQUENCES: Major project overages jeopardized the relationship. Goodman got the blame for a lot of what was out of her control. First, the client's system crashed when one of the client's programmers tried to install unauthorized development software after hours one night. Next, an electrical fire brought the system to a halt. For three weeks her staff was out of work, trying to mirror the system and do what they could to work around the fact that they couldn't access their own code.

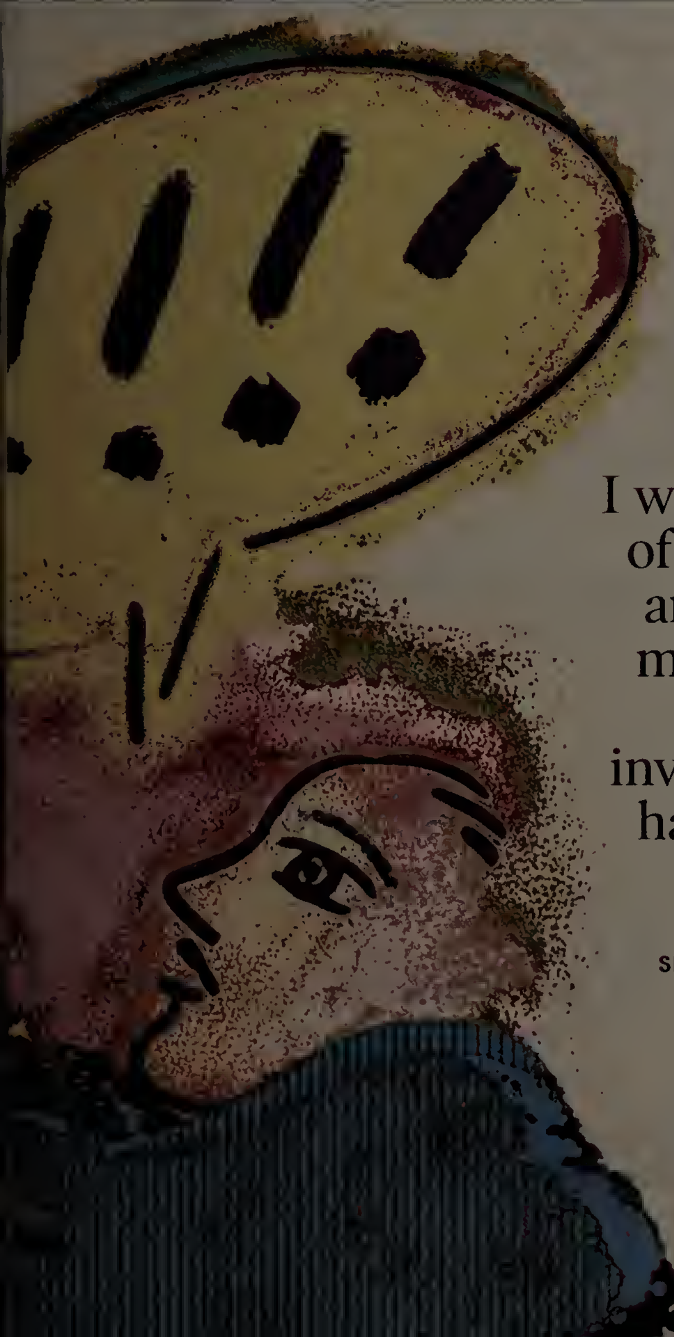
"The idea that we could have a negative parting was very disturbing," she says. "They are such a big client that it was critical that I could still use them as a reference at the end of the day. It was nerve-racking."

LINGERING IMPACT: A loss of income from overruns on the fixed bid and time spent reworking the relationship. The client balked at paying for a percentage of the cost overruns, even though the contract specified it. Goodman decided to take a loss of about $6,000. "There was a concession that I share in the suffering," she says. "I did it because they were a good client. It was more important to save the relationship than to go after the money."

She also spent a lot of time after the fact trying to determine where things went off course. Then she had to convince the client of the cause-and-effect scenario she uncovered. "I went through a teaching process about what happens when you bring in contractors and what each party's responsibility is," she said. "I guess I did it successfully enough because we still have a really good relationship. We continue to get work because of them."

LESSON LEARNED: Stick by your guns, no matter what. In a fixed-bid situation, especially one involving multiple teams, you must maintain control, Goodman says. If she had insisted that her client let her conduct business as usual and manage the project, the problems wouldn't have occurred. Now, if a client isn't willing to let her manage, she declines the job.

SILVER LINING: A new awareness of her core competencies. Goodman emerged from the debacle with a better understanding of and renewed commitment to her own skills. "I believe my core competency is in my project management skills and my development methodology, and I am not willing to sacrifice that for someone who wants a head to do work. It's the strength I bring to the table, and I have made an absolute commitment to it."



SUSAN LEVAN

> "I walked into a maze of their ineptitude and sent three of my people into it. If I had been involved . . . I would have seen the red flags sooner.
>
> SHULI GOODMAN,
> SEVENTH GENERATION INTERNET,
> SAN FRANCISCO

David Zimmer

- *President, American Eagle Group in Warrington, Pa., a partnership of three consultants.*
- *Also president of the Independent Computer Consultants Association in St. Louis.*
- *Specialty is electronic communications and management consulting for midsize and large companies.*
- *Consulting for seven years.*

FATAL MISTAKE: Lacking a diversified set of skills. Zimmer struck out on his own, offering high-level strategic consulting in electronic messaging, just as corporate e-mail was taking off. Preparing for the next step, he began refining his expertise with a focus on unified messaging — integrating voice-mail, fax technology and e-mail in the same box with accessibility from the PC or telephone. But by mid-1997, he found himself in a valley between two peaks in demand.

"I should have seen that e-mail was becoming more commonplace," he says. "The demand for my skills dried up very quickly, and the demand for unified messaging was not picking up as fast as I expected. So, there was a major gap."

When a major contract ended in May 1997, Zimmer was out of work with few prospects of maintaining his cash flow.

CONSEQUENCES: Enormous debt accumulated. Zimmer never anticipated that business would remain flat for 20 months. The payment for his last contract kept him and his family going through the summer, but by that fall he had to start dipping into his savings. And at the end of last year, he had to liquidate some of his retirement funds.

"I have some left, but I certainly wouldn't retire rich," he says. "Fortunately, I don't plan to retire for a while, and my plan is to pay myself back, just like I would pay off my creditors."

LINGERING IMPACT: Major downtime had a yo-yo effect on Zimmer's emotions. He kept bidding on jobs and kept getting turned down. Many times he was prepared to start a job on a Monday only to get a call on Sunday night canceling the contract. "I can't say there weren't times when I was depressed, but I was very careful that it didn't affect my confidence and self-esteem," he says. "I kept in mind that people weren't rejecting me, they were rejecting my offer."

LESSON LEARNED: Sock away the money when you're making it, and take steps to broaden your horizons. Had it not been for his savings, Zimmer would have been forced back into a salaried position. He's now a firm believer that consultants should have at least six months' income stored away. "You have to stay out of debt as much as possible. Put money away for a rainy day because if you're a consultant, the rainy days will come," he says.

In his resolve to remain independent, Zimmer diversified, picking up e-commerce and knowledge management expertise. He also decided to position himself as a unified messaging market leader and began publishing papers, meeting with vendors, organizing conferences and making presentations nationwide. Last year he began co-managing the Unified Messaging Consortium, which is funded by nine major vendors, and he's being approached by several companies to do cost-of-ownership studies. "A dry period can be very good for you," he says.

SILVER LINING: A new clarity of vision. Zimmer is more committed to his consulting practice than ever, he says, having gone through "a tremendous amount of personal growth." The unified messaging market is finally starting to pick up, and he's primed.

"When the money dries up, you get a clarity of focus about why you are in the consulting business," he says, adding that he turned down a couple of six-figure job offers. "Even though I was desperate for money, I need autonomy, independence and the ability to make a difference. Getting buried inside a company in a position that didn't offer that would be more frightening to me than being desperate for money." ◗

Goff is a freelance writer in New York.

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TRAINING
PROS AND CONS

HERE'S SOMETHING MOST information technology professionals already know: Their skills are in a constant state of limbo.

The result is a desire for training — and lots of it. IT workers want constant tips on how to best expand and polish their skills. That's because knowing how to run the application or code in a programming language is a tremendous advantage in a world where businesses are trying to keep pace with technology and are bringing that technology to the forefront of their business efforts.

But with little time on their hands, IT professionals don't want to have to play hit-or-miss when choosing among training methods and providers. But the truth is that a mix of those approaches is your best bet, many IT professionals say.

Here are some tips from IT workers, corporate trainers and others on what to look for in the popular IT training methods on the market today.

— By Tim Ouellette

Training Options Abound

Companies are using more than the traditional classroom training methods to get workers up to speed:

METHOD	1997	2000
Classroom training	78%	61%
Electronic technologies	9%	23%
Self-paced methods	7%	10%
Other	6%	6%

SOURCE: AMERICAN SOCIETY FOR TRAINING AND DEVELOPMENT

IT Training Crunch

The average number of training days per IT professional is on the decline:

1997	1998
8.2 days	7.4 days

SOURCE: META GROUP INC., STAMFORD, CONN.

Classroom or Instructor-Led Training

(Including continuing education courses and vendor seminars)

PROS: Even with the growth in Web-based training technologies, most IT professionals agree that classroom training is still the most powerful way to capture the attention of trainees and provide immediate, authoritative feedback. The majority of vendor certifications are earned through classroom training offered by vendors like Microsoft Corp. and Novell Inc., and up to 80% of all IT training will still come in the classroom, according to various studies.

When is the best time to choose an outside course? When you're moving to a whole new application or system, says Bill Terrell, CIO at Maine General Health in Augusta, Maine. "That way, you can get everyone away from the phones to focus on the new material," he says. Even though other training methods are used by his IT staff, they also go to vendor training courses.

"Very general courses need more interaction between teacher and student and are better suited to classroom settings," says Doug Upchurch, executive director at the Information Technology Training Association in Austin, Texas. For example, a good way to train IT professionals on Windows NT 5.0 would be to start with an overview course and then apply different approaches to more specific aspects of NT 5.0, he noted.

One bonus, according to Key Note Ltd., a U.K.-based research firm, is that because of time constraints, employees sent to training classes may feel more valued by their employer and more motivated.

CONS: Let's face it, as IT workers deal with tighter and tighter schedules, it isn't always feasible to get out of the office and spend a day or more at a classroom training session. It also requires a large chunk of companies' training budgets to cover travel, lodging and meals.

For example, Brett Johnson, an independent IT contractor in Atlanta, used to attend continuing education classes at local colleges. They were fine, he says, but he had to take the time to find the right courses and then stay up late to attend them and study after work.

For example, typical Microsoft Certified Systems Engineer classes can run more than $3,000, says Rodger Rodgers, director of training at Matrix Resources Inc., an IT placement firm in Atlanta. And you have to wait until the class starts to get the training, which may be too much of a delay for some IT professionals.

Although there are many classes and seminars, the number of available offerings could pose a problem. That's because IT workers choosing courses have to be careful about what training company they use, paying close attention to what accreditations each company holds and whether they've been approved by vendors to offer classes for their certification programs.

Still, companies should be willing to put the money up for training classes on new products being rolled out in the company, Terrell says. That way, people can learn the most in the shortest amount of time, without workplace

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distractions. "If you can't afford to educate and train, then maybe you can't afford the product itself," he says.

Computer-Based Training

PROS: Computer-based training (CBT) methods, like CD-ROM or disk-based courses, have freed many IT departments from the burden of scheduling outside classes. IT staff can now get training when they have free time during the day, without worrying about scheduling issues.

That's especially important for refreshing people's memory on certain topics that may have been skimmed over in classroom training.

For example, Johnson uses CBT courses from his placement firm, Matrix Resources. Johnson credits the CBT courses directly with landing his latest job as a C++ and Visual C programmer.

"I believe my current job was a direct result of taking C++ and Visual C training courses," Johnson says. With CBT, "I was able to train at my convenience, which really helps, since demands on my time are incredible."

Another company that has moved from instructor-led training to mostly CBT courses is Carnival Corp., operator of Carnival Cruise Lines. Its IT staff can get most of the courses they need for various certifications right at the company's IS Learning Center.

"Our goal is to make them feel that they don't have to feel that they have to take a class outside of work," says Michelle Serotte, manager at the IS Learning Center. "We want to provide everything they need in-house."

Technical staff can download courses or access them interactively on Carnival's intranet. A dial-up capability lets IT staff on Carnival's various cruise ships also keep their skills up-to-date while onboard.

Companies can offer more classes at a lower price with CBT, rather than trying to schedule and pay for instructor-led training. For example, Matrix offers up to 180 courses on its Web site.

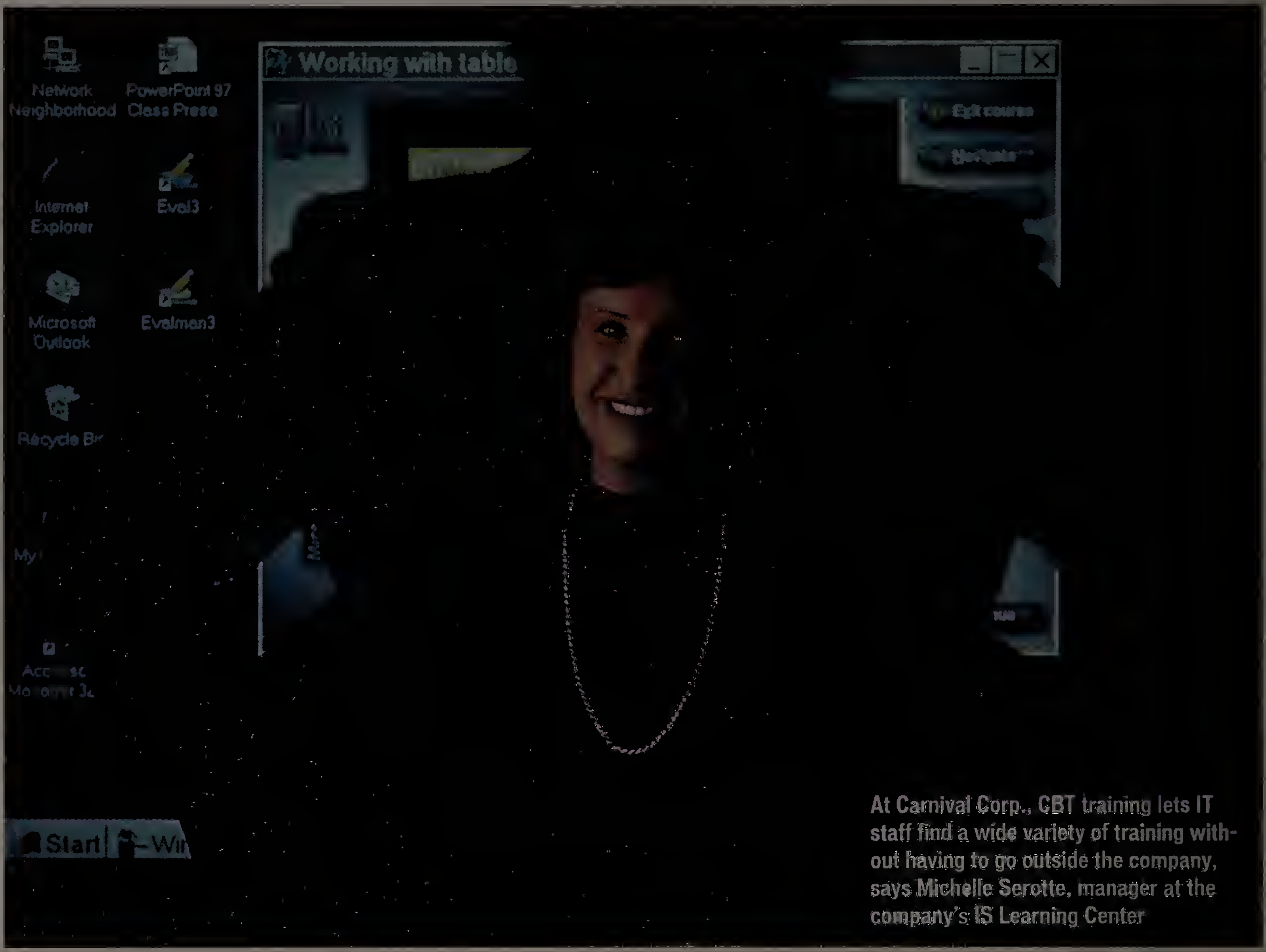
CONS: CBT courses on CD-ROM and disk can be cumbersome to maintain and track.

"We have looked at going all CBT," says James West, CIO for the state of Indiana Auditor's office. "But it became shelfware pretty quickly for us because if someone is not doing the logistics behind it, like taking attendance and keeping records and making sure the library of courses is up-to-date, it does not work."

That's why West wants to have a mix of custom-developed classroom courses with a trainer and CBT to back it up.

IT professionals recommend a close study of vendors' wares before choosing a firm.

CBT testers also recommend to be sure the courses have a way to benchmark the users' skills at the start of the course and a way to test them on their improvement at the end of the course.



At Carnival Corp., CBT training lets IT staff find a wide variety of training without having to go outside the company, says Michelle Serotte, manager at the company's IS Learning Center

JEFFREY CAMP

Web-Based Training or Distance Learning

PROS: Web-based training is helping to wipe out some of the limitations of CBT. Users can download courses with a Web browser or run the courses interactively while connected to the Internet. And chat rooms or discussion lists can provide a level of interaction among students and even mentors that traditional CBT lacks.

For example, Matrix Resources offers all of its IT consultants access to more than 180 CBT courses on its Web site. Soon, those courses will be run directly from the Web server, providing a way to track who takes the courses, how they did on the tests and what skill sets are available among staff.

Additionally, the company can make sure everyone is taking the most recent courses, because it's easy to update the courses right on the Web server, Rodgers says.

Carnival is taking a similar approach by offering dial-up access to technical staff to its CBT courses on a company intranet, Serotte says. Users can run the courses from home on their Web browsers without taking up space on their hard drives.

That access lets employees get quick, unscheduled updates to their skills in small bites, like an hour at a time, which is impossible to replicate with classroom training, Serotte says.

CONS: Classroom training and even CBT courses have a set of standards to follow, but there are no standards for Web-based training yet because the market is so new, according to Upchurch. That means the quality of offerings will vary greatly among different vendors.

And as vendors offer more complicated Web-based training tools, users will have to depend more on integrators to help make sure networks can handle the technology and to provide clear ways to track student progress, according to International Data Corp. in Framingham, Mass.

Videos

PROS: Videos let users watch other people doing an IT task correctly, which can be a powerful way to learn. And anyone can buy or rent a video to watch in the comfort of his home affordably. For example, one IT staffer at a retailer in the Midwest said training videos from PeopleTrain Inc. in Atlanta offered her a way to inexpensively keep up-to-date on the Windows 98 upgrade. Additionally, she liked having live examples of what to do instead of reading it or hearing it in a class.

CONS: Users need to have a television, VCR and a computer that's loaded with the application being presented to benefit from video training. Serotte didn't include videos in Carnival's training center because that would have meant buying many more licenses of different applications to load onto training PCs. Instead, the CBT courses Carnival uses simulate the application in question so that no extra application licenses need to be purchased.

Upchurch says fewer sites are opting for video training because Web-based training has improved to allow video streaming to the desktop, making the video experience less tied to cassettes.

Books

IT professionals say books are an easy and portable way to train and brush up on certain skills but are limited in their ability to test progress or provide an interactive environment. And as training tools, books may not be as fast as running a CBT course or taking a half-day seminar. ◗

Ouellette is a freelance writer in Scarboro, Maine.

JOE AUER/DRIVING THE DEAL

Beware of software upgrade insurance

THERE'S AN EMERGING trend I must warn you about. Software companies are excluding new releases of the software you've bought from the maintenance and support fee you already pay. They're adding fees, only they're often calling them "upgrade insurance." There's no better way to say it: We should resist paying for upgrade insurance. By using the term "insurance," those vendors want us to feel we're covered for some unforeseen or unusual event. Nonsense. It's just a way for the supplier to charge a new fee for a service that has always been included.

Traditionally, software maintenance included bug fixes, help-desk support, enhancements and new releases (a.k.a. major enhancements). Although most basic maintenance programs still include the first three, the inclusion of new releases is now becoming an open question with upgrade insurance. Just to be clear, new releases are usually indicated by a change in the number to the left of the decimal, such as 3.5 to 4.0. Enhancements are usually noted by changes to the right of the decimal, such as 3.4 to 3.5, and are sometimes called point releases.

Regardless of the names, it's important for us to insist that software maintenance and support include everything. To fully realize the benefits of standardized software packages, we must be kept current. Software that remains static undermines the fundamental reason for moving away from in-house custom development. After all, the supplier is joining us with other users to collect common requirements and spread costs. Maintenance and support fees were originally designed to do just that — provide dynamic software that evolves with changing business conditions.

So how do we counter the upgrade insurance racket? We should include maintenance and support as part of the licensing negotiations. That raises the deal's value and also ties the deal's completion to resolving all maintenance and support issues at the time of licensing. That way, the supplier risks losing the entire deal over just a maintenance issue. It's easier to get vendors to concede that maintenance and support include everything, even new releases of the software, when we have bargaining power. If we fail to get that concession, we'll in essence be relicensing the software with each new release.

Forest First, Then the Trees

One of the most frustrating traps a negotiator can fall into is negotiating specifics before resolving the broad principles of the deal. For instance, if the supplier hasn't agreed to the principle of sharing the risks of implementing a new system, discussing specific warranties and remedies for supplier nonperformance could be a significant waste of time. Yet most users, including some of the biggest and best in the business, fall into this trap time after time.

What happens is relatively simple. The supplier, sensing our urgency and that we're not doing any comparison shopping, is reluctant to engage in serious negotiations, while noting delays in its legal department. In the meantime, the supplier tells a needy end user of ours that we're delaying the deal with contract mumbo jumbo, which doesn't help the strength of our negotiation position.

JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at joea@dobetterdeals.com.

Now we're worried about whether the supplier will actually address our important issues in time to meet our deadline. After more delays — so the supplier can drive up our blood pressure some more — the supplier agrees to negotiate. Now comes the next ploy: When we sit down, the supplier's negotiator suggests that things would go faster if we addressed the contract section by section and line by line. Then he asks us to justify each and every change we request, challenging us to "sell" the supplier on why it's necessary. Any change we propose is likely to be countered by the supplier. A loud ticking sound permeates the atmosphere, reminding us of our deadline.

Any hope we had of controlling the negotiations is sacrificed to the scrutiny of details, and we're running out of time to go to alternative sources. We're trapped into negotiating specific changes to a form contract that has been carefully prepared and refined by the supplier over a period of years. The result? We get no substantial concessions, only meaningless fluff.

The tip? Pin down the major issues early in the negotiation when you still have negotiating power and can go to alternatives. That's vastly more effective than haggling over details first. Negotiating principles first also speeds up the process because an agreement on a given principle is a precursor to agreement on all the embedded details. It helps us buyers control the negotiating agenda and timing and maximize our power and time.

Remember: We're the customer, and we've got what they want — the money. ◗

WORKSTYLES

What It's Like to Work at . . . Universal Studios

Interviewee: Jim Waters, vice president of information services.

Company: Universal Studios Escape, comprising Universal Studios Florida theme park, Universal Studios Islands of Adventure theme park, hotels and an evening entertainment complex.

Location: Orlando

IT employees: 63

Total employees: 3,000

How close is the IT staff to the theme park? One block away.

What does IT support? The point-of-sale systems (for food service, tickets and merchandise) and sales and marketing, finance, human resources, reservations and customer-service representatives.

Dress code: Officially, it's business attire with business casual on Fridays, but as in most business environments in Florida, especially in summer, we turn into business casual every day of the week.

Workday: We stagger our hours to match the park hours. So the network and desktop maintenance group typically starts the day at 7 or 7:30 a.m., with some coming in as late as 1 p.m. Computer operations and help desk work 10 hours per day, four days per week. Programmers and systems developers start at 9 a.m. and get out at 6 p.m.

What do you see in people's cubicles? We try to keep things as tidy as possible. Everyone cleans their desks at the end of the day. There's a general feeling here that clutter does not produce productivity. People have personal items, like photos.

What's the most popular character for wallpaper, screen savers and mouse pads? Spiderman, Dr. Seuss, *Jurassic Park.* We just announced a *Men In Black* attraction, so I'm sure that's coming.

What's on your PC? I went to Florida State University, so for wallpaper I have an action shot from the end-of-the-season [football] game, when we defeated our big rival, the University of Florida. That will stay on there until football season begins next year.

Must people carry beepers? Cell phones? Yes. Almost everyone has an alpha pager and about 60% have cell phones. Some of the [point-of-sale] support people carry radios instead of cell phones.

In-house cafeteria? A large cafeteria, called the Employee Grill, makes sandwiches and hot and cold prepared foods. Throughout the park we have minigrills for park employees; right outside our door we have the U Cafe, a minigrill with sandwiches, soups, pastries and juices.

Cafeteria rating - 1 to 10 (best): 10.

Free drinks: Coffee, spring water.

Vending machines: One for snacks, one for sodas.

Little perks: Discounted movie tickets, free admittance to the theme park and complimentary passes to the park for friends (number of passes depends on employees' years of service).

Do IT employees work in the park? We do a Mardi Gras celebration in the park every year, with a parade and concerts on the weekends. Employees can ride on the floats, and even those who have been here a long time still like to sign up and ride. They throw beads and coins to the crowd.

Would employees feel comfortable e-mailing the CEO? I think so. Twice a year, a panel including the CEO and senior management takes questions from all the employees. I think that certainly encourages people to know they can e-mail the CEO or other managers.

Quote: "We work together quite well as a team, and I think it's more rewarding here than other companies I've worked at because it's so much easier to see how your systems get used in the business. Inside the park, you can see your systems in action and how they are helping the company provide high-quality guest services."

- Leslie Goff

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TECHNOLOGY

WIN 2K: ALL OR NOTHING

All IT managers deciding whether to upgrade to Windows 2000 should take note: You're going to have to upgrade client PCs to give them the benefits of Windows 2000's most valuable features, such as Active Directory. But is it worth it? ▸ **80**

WHY XML WON'T OUST EDI SOON

Vendors are pushing XML, but larger user companies won't scrap their EDI systems any time soon. That's because they've made huge investments in existing technology. Another problem is the lack of standard data tags in the hot new format. ▸ **69**

FIGHTING NET SPIES - FOR FREE

FreeS/WAN, a free, Linux-based software tool, allows network administrators to create encrypted tunnels on the Web by using proposed Internet Protocol Security standards. ▸ **76**

SCO CHIEF BLASTS LINUX

Linux backers get all the press these days, but Doug Michels, president and CEO of The Santa Cruz Operation, argues that the "young punk kids" developing it don't realize that Linux can't match Unix when it comes to scalable, reliable and companywide applications. ▸ **71**

AFFORDABLE SUPPLY TOOLS

Supply-chain planning tools have been bought mostly by large manufacturers that could afford the $1 million or more up-front price. But vendors are starting to take smaller users' needs into account via lower-cost products or reduced pricing through distributors. ▸ **69**

THIS CRAY FOR HIRE?

Designers of racing yachts — not to mention beer cans and cars — can get lower-cost access to supercomputers by renting, rather than buying, time. ▸ **74**

QUICKSTUDY: WRAPPERS

More of the information you receive over the Internet might soon be sent in digital wrappers. Those pieces of code help prevent software piracy and secure your e-mail. ▸ **79**

FRANKLY MOVING

Where's columnist Frank Hayes these days? He's found a new home on *Computerworld*'s back page. This week, Hayes explains why he can't believe IT shops are considering installing a beta version of Windows 2000. ▸ **98**

MORE

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SETH AFFOUMADO

PERSONIFY CEO EILEEN GITTINS: Helping Web sites identify beacons that distinguish buyers from lookers

EMERGING COMPANIES

IT MANAGERS SHOULDN'T BE forced to make crucial Website decisions such as where to put product information or links to other pages. In the debut of our weekly Emerging Companies page, read how a San Francisco start-up is offering customized data mining to help business managers make those decisions — at a stiff price.

77

"Our readers don't think about business in terms of technology. In fact, a lot of the people I talk to aren't even in the IT department. They're marketing managers trying to figure out how to use e-commerce to sell widgets. Or business owners working to keep their supply chain intact. My job is to help people connect the dots...to see how others are doing things, where the pitfalls are, and how they can avoid them. That's what business leaders need to know. I try to give them some new ideas, to spark their imagination. I want our readers to walk away charmed and connected. But most of all, I want them to come back."

Live Wire

Julia King, National Correspondent

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SUPPLY-CHAIN PLANNING VENDORS TARGET MIDMARKET

Oracle, other vendors unveil lower-cost packages aimed at customers with revenue of less than $500 million

BY CRAIG STEDMAN

Supply-chain planning tools are used now mostly by large manufacturers that could afford to shell out $1 million or more to buy and install the software. But the price is starting to be right for smaller users.

Several vendors including Oracle Corp. are reaching out to midsize manufacturers with new planning applications designed as lower-cost alternatives to the supply-chain packages sold by vendors like I2 Technologies Inc. and Manugistics Inc.

In their own attempts to cut costs for users, I2 Technologies and Manugistics are starting to sell through distributors that they have authorized to charge lower license fees than big manufacturers pay.

Those two developments are putting supply-chain software within the grasp of some midsize companies, with annual revenue of less than $500 million, that want to use the technology to improve their production planning and to get a better handle on when orders can be delivered to customers.

Planning Tool

For example, Dialight Corp., a Manasquan, N.J., maker of lighting products for electronics and transportation uses, is due in July to go live with a planning tool that Mapics Inc. announced last month as an add-on to its enterprise resource planning (ERP) applications for midsize users.

Chris Christiani, vice president of operations at Dialight, said the new software doesn't have enough functionality to track available manufacturing capacity and schedule production as customers place orders.

But it should be able to predict delivery dates based on the raw materials in stock — a process that now "takes 20 to 30 minutes for each order, using a calculator," he said.

Automating that would go a long way toward eliminating production bottlenecks and improving customer service, Christiani said. And Dialight is paying only about $170,000 for the supply-chain tool, he added.

Joint Development

Atlanta-based Mapics jointly developed the planning package with Symix Systems Inc., a Columbus, Ohio, ERP vendor that announced its version of the software in January.

Oracle's upcoming supply-chain tool also will target users of its ERP applications who don't need all the capabilities I2 Technologies and Manugistics offer [CW, March 22].

I2 Technologies and Rockville, Md.-based Manugistics said their new distributors sell the same software larger manufacturers buy but can charge less on the grounds that smaller users get smaller paybacks. I2 Technologies, in Irving, Texas, said midsize companies could pay just $150,000 to $250,000 for its tools.

Before, I2 Technologies "had the technology, but not the price," said Bill Scheske, master production scheduler at Taubensee Steel & Wire Co. in Wheeling, Ill.

But the pricing is competitive enough so Taubensee can now afford I2 Technologies' production planning module, he said.

Taubensee, a maker of steel bars and wire, plans to start using the software by August. The company expects to cut inventory costs and improve its ability to tell customers when orders should be ready, Scheske said. Figuring that out now "is kind of a drawn-out process" involving manual steps, he added. ▶

MOREONLINE
For supply-chain resources such as FAQs, organizations, publications, links and articles, visit our Web site.
www.computerworld.com/more

JUST THE FACTS

Supply-Chain Planning Tools

What they do: Run advanced algorithms to forecast demand and develop production schedules and inventory replenishment plans

How they work: Sales and order data are fed to the tools, which build the plans and send them back to ERP systems

Who sells them: Supply-chain vendors such as I2, Manugistics and Logility; ERP vendors such as SAP, Oracle and PeopleSoft

---

XML Poses No Big Threat to EDI – Yet

Lack of standards worries customers, but fear of obsolescence may trigger switch

BY CAROL SLIWA
LAS VEGAS

Vendors are pushing the Extensible Markup Language (XML) as a more flexible format for exchanging business data among trading partners. But many large user companies aren't ready to scrap their big investments in traditional electronic data interchange (EDI) systems for XML.

"If it ain't broke, don't fix it," was an oft-heard sentiment at the annual Data Interchange Standards Association (DISA) conference here earlier this month.

Another barrier is the lack of standard data tags in the new XML format. But attendees packed a conference session to learn more about XML, which some industry observers tout as an eventual replacement for EDI's X12 standard format.

Steven Bell, an analyst at Forrester Research Inc. in Cambridge, Mass., predicted that during the next year companies will start using XML to exchange information they can't share using EDI. "I think X12 will morph into an XML-based standard," Bell predicted, but he said he doesn't see EDI becoming obsolete any time before 2003.

Backers say XML makes it easier to change, exchange and use data of any type, particularly because the tags can be written in English. Standard EDI — intended for automated data exchange among business systems — is more cryptic and includes strict limits on the number of characters and position of data in a document.

Even when they use the X12 standard, companies typically have to consult with their trading partners to adapt EDI documents to suit their needs.

Nelson Peck, e-commerce coordinator at Kodak Polychrome Graphics in Victor, N.Y., said he hopes XML will help him to reach smaller business partners that have resisted EDI because of the cost and complexity of setting up a system. But Peck said he wants to see standards for XML and EDI.

Right now, standard data tags are merely works-in-progress at a variety of different organizations and vendor-led consortia (see chart).

One of the more promising XML efforts is the high-tech industry's RosettaNet consortium, which is creating an XML-based supply chain that's expected to be ready next year.

Meanwhile, EDI users will stay tuned, because they must be prepared for the day when one of their major trading partners forces them to switch to XML.

"I don't want to get caught behind," said Tom Gustafson, EDI coordinator at Taylor, Mich.-based Coughlin Logistics Co., which engages in EDI transactions with the Big Three automakers. ▶

MOREONLINE
For resources related to XML, EDI and XML for EDI, visit our Web site.
www.computerworld.com/more

Sorting Out XML Efforts

Extensible Markup Language (XML)/electronic data interchange (EDI) standards efforts include the following:

COMMERCE XML A subset of XML that will define standard sets of data needed by companies that buy and sell goods and services over the Internet. More than 40 vendor and user companies, led by Ariba, support CXML.

COMMON BUSINESS LIBRARY Set of XML schema for common business terms and documents that allow trading partners using different XML standards to do business; big backer is Commerce One.

AMERICAN NATIONAL STANDARDS INSTITUTE'S X12 In conjunction with CommerceNet and the XML/EDI Group, it will put out report in June about how to define a data element in XML.

BIZTALK Microsoft's newly announced technology for business-to-business communication.

ROSETTANET Computer industry consortium that's building an XML-based supply chain, borrowing data sets from EDI.

BRIEFS

Idetix Rolls Out Web-Content Editor

Idetix Inc. has released Revize 2.0, software that enables Web-content editing via a Java-enabled browser while protecting site structure and layout. The software is platform- and Web-server-independent, according to the Troy, Mich., company. It provides security via multiple access levels and separate permission controls for publishing.

The software costs $895.
www.idetix.com

Web-Casting Tool

Netpodium Inc. next month will ship Netpodium 2.0, software for live, interactive Web-casting. The software can engage a speaker and up to 2,000 audience participants in immediate interactions, including one-on-one exchanges, according to the Seattle company. It was designed for executive briefings, investor meetings, press conferences, educational seminars and field-sales updates.

Pricing starts at $9,000 for a 100-seat server.
www.netpodium.com

NeoVista SmartCRM Package Bows

NeoVista Software Inc. has announced SmartCRM, customer relationship management software designed to drive one-to-one marketing. The software lets users selectively target campaign recipients using mining techniques rather than SQL selections, the Cupertino, Calif., company said. It works with any existing Open Database Connectivity-compatible database.

Pricing starts at $360,000 for a database configuration containing up to 1 million customers.
www.neovista.com

Workflow Suite

Datamax Technologies has announced VisiFlow Suite 4.0, software for workflow, electronic data management, computer output to laser disk and forms recognition. The client/server software helps add automation to insurance, banking and government applications, the Culver City, Calif., company said. It has a new 32-bit architecture and offers native support for major relational databases.

Average pricing for per-seat licenses ranges from $2,200 to $2,500.
www.dtmx.com

Automation Tool For Lotus Domino

Percussion Software is shipping PowerFlow 4.0, a tool that adds automation to Lotus Development Corp. Domino applications using a visual drag-and-drop designer rather than scripting.

By separating the automation from the application, PowerFlow's engine enables background execution of document transitions, according to the Stoneham, Mass.-based company.

The developer kit costs $3,995. The deployment engine costs $6,500.
www.percussion.com

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SCO's Michels Blasts 'Punk Kids' Linux

"It's weird," said **Doug Michels**, president and CEO of The Santa Cruz Operation Inc. (SCO) in Santa Cruz, Calif., which owns the rights to Unix. "We won the war. We beat the minicomputers. . . . We still think of ourselves as rebels, but we're boring establishment now."

The rebel these days is the open-source operating system called Linux, which Michels blasted in a recent talk with *Computerworld* industry editor Joseph E. Maglitta.

Q: Do you consider Linux friend or foe?

A: Linux is a religion. It's like considering the Catholic Church a competitor. I'm not a religion; I'm a commercial operating system.

Companies like Red Hat . . . take Linux technology with a lot less value added, and they package it up and say, "Hey, this is better than SCO." Well, it isn't. And very few customers are buying that story.

Q: Do you see Linux as Unix Jr.?

A: Linux didn't break any new ground. They took the [application programming interfaces] of Unix and re-engineered that lightweight kernel that implemented those APIs. Linux is just a kernel . . . but it's nice, elegant and small, easy to understand. So now we've got some punk young kids who've taken and engineered pieces around the Unix [kernel].

MICHELS: "They're not in control of their road map"

Q: What are Linux's weaknesses?

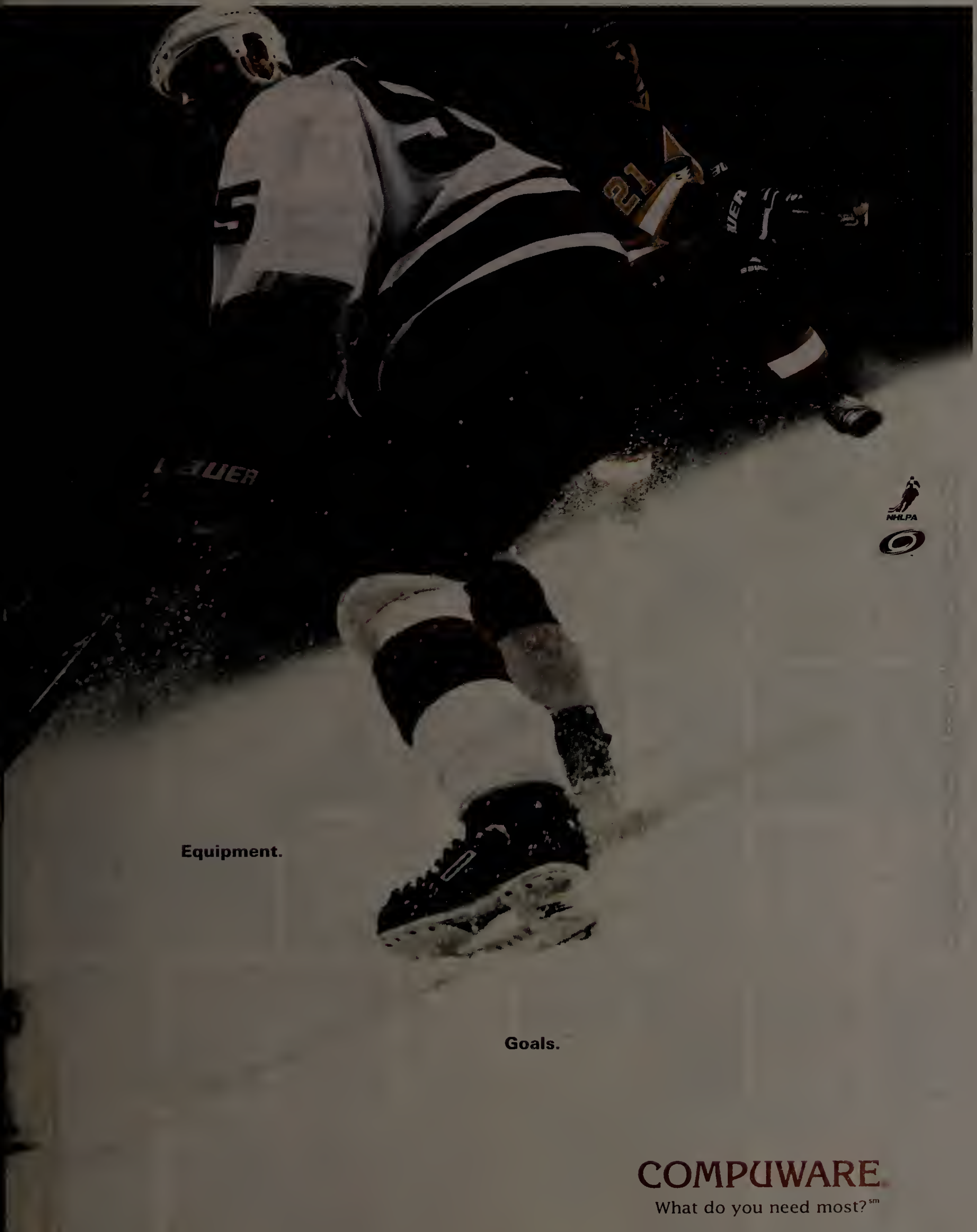
A: They're not in control of their road map. They ship whatever happens to be current in the Linux community. When you're selling to [major corporations], they want to know who you are, where you're going, where you've been, how you treat customers. Second, Linux products are not particularly scalable and don't handle multiprocessors well.

Another thing is reliability. It takes millions of dollars to run [reliability] tests. It takes expensive people, expensive labs, expensive [electric] bills, racks and racks of hardware, and really boring, hard, grubby work. It isn't stuff that people do for fun at home with volunteers.

[Then there's] the whole intellectual property issue. The last thing they want is some kid from Norway to sue for $100 million for misappropriation of intellectual property.

Q: But you see Linux providing modules for SCO?

A: As far as I'm concerned, it's free R&D. A lot of developers who have always preferred Unix are developing on Linux. The last thing in the world I want is some cool app and have my customer go, "Oh, God, if I only had Linux, I could get that app." ▶



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BRIEFS

HP Ships New NT Workstations

Hewlett-Packard Co. is shipping a new family of Windows NT-based HP Visualize Personal Workstations based on Intel Corp.'s Pentium III and Pentium III Xeon chips. The systems are targeted at technical and creative users who require 3-D graphics, according to the Palo Alto, Calif., company. They can house single or dual 450- or 500-MHz Pentium III processors.

Pricing starts at $3,225.

www.hp.com

Interlink Pen Input Device Release

A new pen input device that captures handwritten signatures for use in network applications is now available from Interlink Electronics Inc. Called ePad, the device can be used to sign electronic documents and forms, authorize electronic transactions and access signature-based security systems, according to the Camarillo, Calif., company.

It costs $69.95.

www.interlinkelec.com

Entry-Level Server

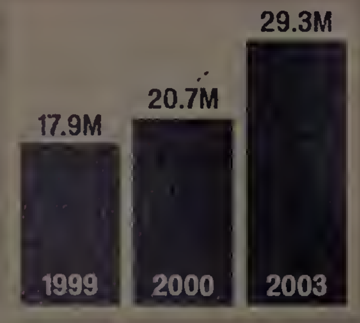
AST Computers LLC has announced the Premium 1000, an entry-level workgroup server that incorporates either Intel Corp.'s 350-MHz Pentium II processor or the 500-MHz Pentium III.

The system comes with 128M bytes of memory, a 20G-byte tape backup unit and Microsoft Corp.'s Windows NT Server 4.0, according to the Los Angeles company. A Pentium II system costs $2,857.

www.ast.com

Laptop Sales Rise

Global forecast for laptop unit sales:



SOURCE INTERNATIONAL DATA CORP. FRAMINGHAM MASS.

SAILORS HOPE FOR SUPER DESIGN EDGE

Hawaiian center rents supercomputer to local America's Cup hopefuls, others

BY JAIKUMAR VIJAYAN

WHEN THE Abracadabra 2000 is launched off the coast of Maui in June, a Kahuna — or Hawaiian priest — will be on board to bless the yacht before it makes its maiden voyage to New Zealand for the America's Cup XXX race.

That will be about the only traditional thing about the boat. Being designed for the Aloha Racing Foundation, which is based on the Hawaiian island of Maui, the Abracadabra is the result of supercomputer-aided design and testing aimed at squeezing out every last knot of speed.

Advanced computational fluid dynamics — usually applied in aircraft testing — are being applied to the keel, keel bulb, rudder and sail to ensure the yacht is optimized for operations in the waters off Auckland, New Zealand, where the race will be held.

"We are looking for the tiniest differences in design. The reality is, the race is won in the design office before the boat even hits the water," said Ian Burns, a designer at the Aloha Foundation.

Using the supercomputer has helped Aloha Racing realize savings of up to $40,000 on prototype models used in tank tests (tests of a scale model of the yacht in a tank of water) and savings of more than $60,000 on wind-tunnel tests. It also cut weeks off the time it usually takes to get the results from such tests.

Abracadabra is one of the many commercial applications for which the Maui High Performance Computing Center (MHPCC) is hoping to rent its supercomputers. MHPCC (*www.mhpcc.edu*) is a national supercomputer center established in 1993 by the University of New Mexico under an agreement with the Air Force Research Laboratory.

The center has more than 256G floating-point operations per second — soon to be upgraded to 400G FLOPS — of processing power spread over 603 IBM RS/6000 SP processors, more than 167G bytes of internal memory and 2.1T bytes of storage. High-speed T3 lines connect it to the U.S. mainland. The institute's charter is to provide its 1,200 customers — mainly defense, government and academic users — the resources they need to run high-performance applications.

Increasingly, though, the center is trying to persuade commercial companies to buy — at prices ranging from $1.25 to $6.50 per processor per hour — some of the 4 million hours of processing time available on its computers annually, said Gene Bal, director of MHPCC. Now, less than 5% of the center's users are commercial customers — one of which is Chevron Corp. The goal is to increase that figure by more actively marketing the institute's resources as a relatively inexpensive alternative to buying high-end hardware, Bal said.

The main commercial demand for such rented supercomputer capacity — long available to academics and scientists — is likely to be for applications such as finite element analysis, fluid dynamics and engineering design, which require computers with very high-end floating-point capabilities, said Jonathan Eunice, an analyst at Illuminata Inc., a Nashua, N.H., consulting firm.

"It's going to be the beer companies wanting to optimize the shape of their cans or the auto manufacturers looking to minimize the use of material in their design, who are going to need this kind of power," Eunice said. ◗

JUST THE FACTS

High-Tech Yachting

What: To build a yacht to race in America's Cup XXX in New Zealand in October

The challenge: Optimize design for maximum speed

The approach: To use supercomputer technology to design and test the boat

How a supercomputer will help: Allows for much faster and cheaper testing of prototype designs compared with traditional "tank" tests

---

HP Unveils Midrange Server at Bargain Price

N-Class aimed at Net, supply-chain apps

BY STACY COLLETT

Hewlett-Packard Co. has unveiled its HP 9000 N-Class Enterprise Server, which offers transaction speeds that rival its competitors for as little as one-third the price.

The new midrange server, priced from $48,000, was designed for Internet-based business applications but is also being touted for integrated supply-chain applications, enterprise resource planning applications and sales force automation. HP's N-Class model N4000 clocks at 49,308 transactions per minute at a cost of $56.67 per minute, according to the Transaction Processing Performance Council (TCP), an independent benchmarking group based in San Jose, Calif.

TPC lists the HP's N-Class server among its top 10 performers. IBM's comparable RS/6000 server, for example, offers 8,000 more transactions per minute, but at a price of $147 per minute.

"This [HP] box is a third of the cost for 80% of the performance. That's pretty significant," said Joe Clabby, an analyst at Aberdeen Group Inc. in Boston.

N-Class servers feature up to eight HP 64-bit PA-8500 processors and run the 64-bit HP-UX operating system. Other features include either 360- or 440-MHz PA-8500 chips, up to 16G bytes of memory, a 7.6G byte/sec. memory bus, a 3.8G byte/sec. system bus, a 5.8G byte/sec. I/O bus, two internal hot-swap disk bays and 12 Peripheral Component Interconnect I/O slots. The new server will also let users upgrade to future RISC and IA-64 processors.

N-Class servers are scheduled for release next month. ◗

Desktops to Dominate PC Shipments, Gartner Says

Desktop systems will continue to hold the largest share of PC shipments worldwide through at least 2002, contrary to the expectations of many computer makers, according to analysts at Gartner Group Inc.

Despite rising portable sales (see chart in Briefs column), desktop PCs accounted for 83% of PCs sold last year and will capture 84% of the worldwide market by 2002, analysts said at a Gartner-sponsored conference in Tokyo last week. Notebooks' share of the market will shrink from 17% to 16% in the same period, they said.

"Consumers don't care about mobility; they care about flexibility," said Scott Miller, an analyst at Gartner. As desktop prices retreat further below $1,000, mobile machines will become less attractive, he said, adding that the average price of a notebook computer is 2.5 times higher than a desktop with equivalent performance. ◗

IDG News Service, Tokyo Bureau

NOTEBOOK EXTREMES
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LINUX-BASED TOOL TACKLES NET SPIES

FreeS/WAN provides users with secure VPN gateways without modifying operating systems or applications

BY ANN HARRISON

FREE LINUX-BASED software released this month fights eavesdroppers by using strong encryption to create a secure data tunnel between any two points on the Internet. It's one of the latest tools to use the proposed IPSec protocol, an eagerly awaited interoperable global standard for securing IP connections.

Called FreeS/WAN, the software automatically encrypts data packets as they traverse the Internet. It lets network administrators build secure gateways in a virtual private network (VPN) without modifying their operating systems or application software.

FreeS/WAN can set up a secure tunnel in less than a second. The software encrypts packets at 6M bit/sec., easily handling the entire available bandwidth at most Internet sites. Unlike proprietary tools, FreeS/WAN is distributed as source code at *www.xs4all.nl/-freeswan/*.

FreeS/WAN protects against quiet eavesdropping techniques such as packet sniffing and attacks that are based on IP spoofing, which attempt to impersonate a computer involved in a communication.

Because FreeS/WAN runs on an ordinary PC, it could offer a free alternative to costly VPN gateway boxes and proprietary VPN software. Gartner Group Inc. analyst Michael Zboray said corporate information technology managers may want to wait until a vendor incorporates FreeS/WAN into a commercial product.

"I love Linux and IPSec, but there is enough trouble integrating this into a kernel and recompiling the kernel that this is just not a no-brainer," Zboray said. Commercial VPN products may be better suited for neophyte users, who may compromise security by making mistakes configuring the software, he added.

John Denker, division manager for information services research at AT&T Labs-Research in Florham Park, N.J., has been using FreeS/WAN to secure Internet traffic over cable modems. Denker said he has had no problems installing or configuring FreeS/WAN, which he said is already well-integrated into the 2.0.36 Linux kernel. Although it took a few days to test FreeS/WAN, Denker said, the investment paid off in a secure system that was more reliable and scalable than those produced by commercial IPSec products.

Henry Spencer, technical lead for FreeS/WAN development, said eavesdroppers may be able to tell which VPN gateways are talking to one another, but the identities of the machines behind them will be hidden. "The long-term objective of this project is to get a significant chunk of the Internet encrypted, and obviously things like wiretapping are going to be much more difficult once that happens," Spencer said.

FreeS/WAN was built and released in Toronto, letting users avoid U.S. export restrictions on the powerful encryption keys it uses to secure communication sessions. FreeS/WAN includes an automated encryption key exchange method called the Internet Key Exchange, which authenticates each party in an IPSec transaction, negotiates security policy and handles the exchange of ephemeral session keys.

FreeS/WAN uses the Diffie-Hellman key agreement with 1,024-bit keys. Each packet of data is also secured with 168-bit, Triple-Data Encryption Standard (DES) encryption.

In preliminary tests, its developers said, FreeS/WAN was interoperable with Triple-DES IPSec products from OpenBSD, Pretty Good Privacy, Cisco Systems Inc., Axent Technologies Inc. and Xedia Corp. and with Secure Shell programs. ▶

SNAPSHOT

Wish List

Attributes that business customers want in bundled services from voice and data carriers. (Bundled services are two or more services together, such as voice and data.)

SCALE OF 1-5, 5=HIGH	
Simplicity of customer service	4.27
Lower overall cost	4.24
Consolidated billing	4.20
Degree of customization	4.12
Ease of use	4.03
Ease of purchase	3.85

SOURCE: SURVEY OF 169 COMMUNICATIONS COMPANIES BY ARTHUR ANDERSEN, NEW YORK

IPSec-Certified Products

These vendors have received IPSec interoperability certification from the International Computer Security Association:

PRODUCT/VENDOR	FUNCTION
Raptor Firewall VPN Server Version 6.0 (Axent Technologies Inc.)	Firewall for Windows NT 4.0
Firewall-1 Version 4.0 (Check Point Software Technologies Inc.)	Firewall products for Solaris and NT platforms
Cisco IOS Version 11.3.3 (Cisco Systems Inc.)	Firewall for Cisco IOS-based routers
Safenet/Soft-PK Version 1.0 (Information Resource Engineering Inc.)	VPN product for desktop or laptop computers running Windows 95 and Windows NT
Gauntlet GVPN Internet Firewall Version 4.1A (Network Associates Inc.)	Firewall product for the BSDI platform
CIPro VPN Hardware Version 1.12, Software Version 3.22 VB3 (RadGuard Ltd.)	VPN product that uses proprietary hardware
Ravlin 10/5100 Software Version 3.10 (RedCreek Communications Inc.)	VPN product that uses proprietary hardware
LanRover VPN Gateway (TM) Version 6.5 (Shiva Corp.)	VPN product that uses proprietary hardware
PERMIT/Gate 2500/4500 Version 1.1 (TimeStep Corp.)	Network gateway product that uses proprietary hardware
PERMIT/Client Version 1.1 (TimeStep Corp.)	Software that secures [illegible] traffic for systems running Windows 95, 98 and NT 4.0
VSU-1010 VPN Service Unit Version 2.0 (VPNet Technologies Inc.)	VPN product that uses proprietary hardware

HP to Develop OpenView Certification

Challenge will be to keep program current

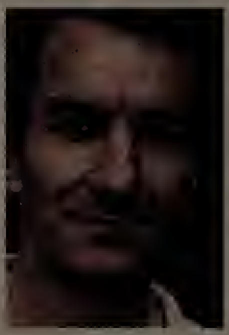
BY BOB WALLACE

IT professionals can begin to validate their skills and knowledge of Hewlett-Packard Co. OpenView network management software and possibly increase their value under a certification program HP is developing.

OpenView's network management software is the most widely used software of its type worldwide, according to International Data Corp. in Framingham, Mass.

HP is initially offering information technology professionals certification for products in three tracks: OpenView Unix for Windows NT, OpenView NT Server and Applications Management, and OpenView Unix Systems Server and Applications Management.

"The certification program is a good move and would let us measure our experience in OpenView," said Paul Edmunds, senior network engineer at Duke Energy Corp. in Charlotte, N.C., a large OpenView customer. His company would likely support and pay for staffers to be certified, he added.


PAUL EDMUNDS: Certification is a good move

The program's IT Professionals level includes classes that are followed by tests administered by a third party to determine whether participants are up to speed on installation, configuration, administration and ongoing product operation.

HP recommends that staffers practice what they learn on their OpenView systems after each of the $1,500 to $2,000 classes and before taking the $100 third-party-administered multiple-choice certification test. An IT worker could become certified in a month.

After certification, IT Professionals could proceed to a higher level called Advanced IT Professionals, which is in the works and would be based on hands-on work with OpenView products, HP said.

One industry analyst sees the need for OpenView certification and a challenge keeping the material covered current.

"By the time you set up the program, the technology may have changed, so it's critical to keep things fresh and current," said Patrick Dryden, an analyst at Giga Information Group Inc. in Cambridge, Mass. "[The program] has to keep up with new software versions, new features and how to use them and how to upgrade," he said in reference to Network Node Manager, HP's core OpenView software package.

Computer Associates International Inc. in Islandia, N.Y., already offers a network management certification program, Dryden noted. ▶

PERSONIFY; TUNING WEB SITES FOR PROFIT

Start-up's data mining techniques let you slice and dice site data to better predict visitors' buying habits

BY CYNTHIA MORGAN

CONSUMER buying habits have been mapped to a nicety in the retail world, where behaviorists can tell you how to stack sodas for the best weekend sales or why car buyers shun brown. But on the Web, where a single mistake can drive a customer away forever, crucial site marketing decisions may be left to the IT department.

Webmasters make site navigation, product placement and ad-buying decisions based largely on anecdotal evidence and relatively simple Web-site logs. But the founders of one start-up, Personify Inc., have applied data mining techniques to Web customer behavior and developed a series of tools that let executives slice and dice Web site data to predict buying habits. Better still, once installed, the system requires little intervention from overworked information technology staffers, so they can keep the site running without also having to worry about keeping it profitable.

Data mining to increase sales isn't new, of course, but it can be very difficult to implement. "The Web is moving so fast that the marketing department can't wait for IT to complete a data mining project and deliver a report. In the time that takes, a company could lose hundreds of potential customers," said Eileen Gittins, Personify's CEO.

Personify has developed the basics of a predictive model for site customers and customizes it for each installation. That can save a great deal of time over do-it-yourself data mining projects. You're as much buying a service from the company as software because Personify contracts include installation and consultation to develop key decision points that drive buyers to buy or not buy.

"We look for beacons that we help the site owner identify," Gittins said. "A crucial beacon for electronic-commerce sites, for example, is the 'order' button. We'll profile the moves a visitor makes which led to that beacon and contrast them with the actions of a customer that doesn't buy. Then the software figures out what made the difference."

Every visitor to the site is monitored, and his behavior at each beacon is recorded.

The service and software aren't cheap; Personify is asking you to bet it will pay off in increased Web sales and reduced IT support costs for your site. Whether you win that bet will depend in part on your business practices.

If your Personify mining expedition tells you that banner ads placed on one site lead to sales or that poor placement is behind a product's low sales, you must be able to react quickly. That could be a problem in companies without a full Web staff, or at those with overwhelming bureaucracy when it comes to site changes.

Web customer modeling is new, but a few successes will expand its popularity quickly. For now, Personify will appeal most to companies with larger, established Web sites, especially if those sites are already profitable or show potential for profits in the near term. ▶

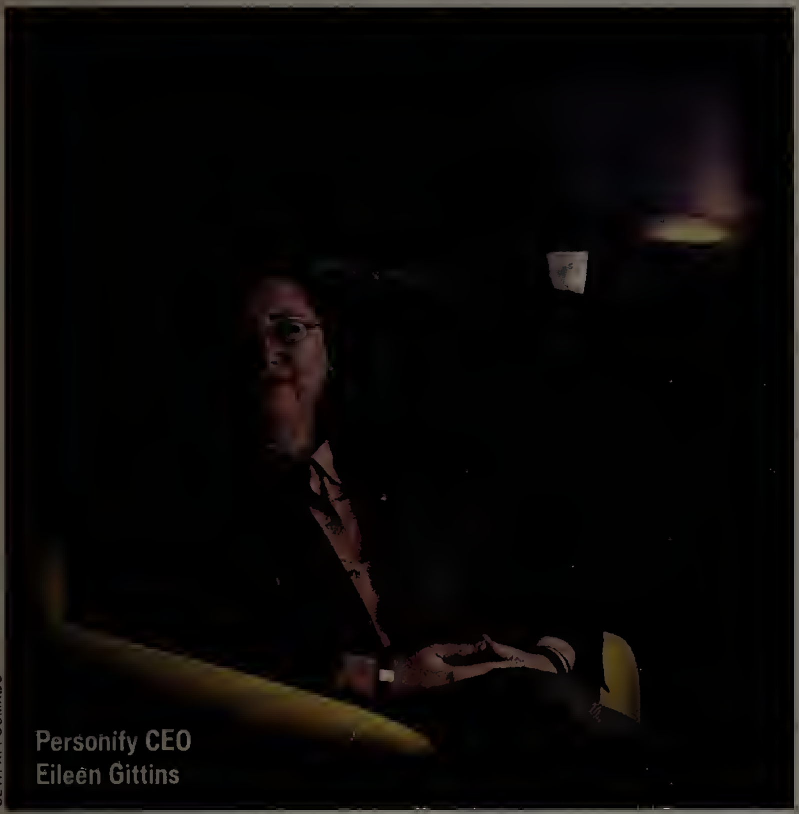
How Personify Tools Work

Personify's flagship product, **Personify Essentials,** monitors a visitor's actions from the time he enters the site to the last mouse click before he leaves. Powered by a series of Java servlets, Essentials gathers the vast amounts of information the visitor generates into an online analytical processing data cube that stores a customer profile for everyone who has ever interacted with the site. The system then extracts "behaviors" that can be used to predict whether, and why, the customer will buy.

Personify sells the base software package along with installation services, ongoing maintenance and consulting for a monthly fee. Standard license plus annual maintenance costs $85,000 and includes the services of Personify business consultants to identify target behaviors, or "beacons" important to a particular customer. Subscriptions start at $5,500 per month.

A second product, **Personify Proactive,** uses Personify Essentials reports to help develop targeted promotions for identified market segments. Currently in beta, it will ship this summer.

– Cynthia Morgan



SETH AFFOUMADO

Personify CEO
Eileen Gittins

THE DOSSIER

Personify Inc.

Personify tools can return Web-site marketing analysis to marketing, where it belongs, and let techies get back to the business of IT

Location:
425 Battery St.
Suite 450 B
San Francisco, Calif. 94111

Telephone: (415) 782-2050

Web: *www.personify.com*

Niche: Predicting Web site customers' behavior

Company Officers: Eileen Gittins, CEO; Steve Krause, president and co-founder; Adam Gross, director of product management and co-founder

Founded: 1996

Employees: 39; adding three to four people per month

Profitability: "Not yet," Gittins says.

Burn Money: Personify's venture capital comes from well-placed sources: U.S. Venture Partners, Asset Management Associates and Alpine Technology Ventures

Customers: More than 30 now, including Novell Inc., Hewlett-Packard Co., Virtual Vineyards.
Average sale: about $90,000

Potential stumbling blocks

The idea's too good: Personify's niche – providing the information marketers need to tailor Web pages quickly – is so obvious that it may not have the market for long. If its techniques catch on, look for competition from data mining and Web-site monitoring toolmakers.

Budget breakers: Corporations tend to regard Web sites as liabilities rather than profit centers and may be loath to add another $90,000 or so to the budget without strict guarantees of profitability.

THE BUZZ

Customer Feedback

Virtual Vineyards Inc.
Palo Alto, Calif.
www.virtualvin.com
Team leader: Cyndy Ainsworth, director of product marketing

Online sommelier Virtual Vineyards specializes in selling an international palette of fine wines to novices and connoisseurs. One of the original beta testers of Personify Essentials, Virtual Vineyards has been using the product for about a year and a half, according to Ainsworth.

Why It Bought the Tool

"If someone's leaving your store without buying, you want to run after them and ask them why. . . . We can't really catch our customers at the door. We wanted a tool that would do that for us."

Does It Work?

"Yes. It helps us understand user patterns on our site. Before, I could say *x* number of people are visiting this page or that, and *x* number are buying, but I couldn't really relate the two. With Personify, I can say *x* number of people who visit this page buy, but two or three times that many buy if they visit another page.

"It's paid for itself, certainly. It's helped us refine our ad buying. I might have two banner ads on a site, generating the same number of sales, but Personify can tell us that people who see one of those ads browse the site longer and visit more pages."

Warts

"It's not completely automatic. There's still pain involved in getting the data on the server and developing meaningful interpretations of what the data really means. . . . We find we get a lot of chicken-and-egg style questions. Did a buyer come to information pages because he wanted to buy, or did what he find on those pages persuade him to buy?

"Personify gives you some great information, but you still have to analyze what it's telling you and translate that knowledge into specific actions to take on the Web."

Wishes

"Our long-term goal is to do Personify analysis in real time, while the customer's still on the site. The current product analyzes the visits that were already made, so by the time you know what went wrong, your customer has gone."

– Cynthia Morgan

Vegging Out

We look at two unconventional gadgets that can help make the world go away

By Howard Millman

WHY WOULD YOU want to wear a pair of opaque glasses studded with pulsating LEDs wired to a black box? Or why would you want to wear a Buck Rogers-like headset that shows movies on 3/4-in. screens? Two words: To relax.

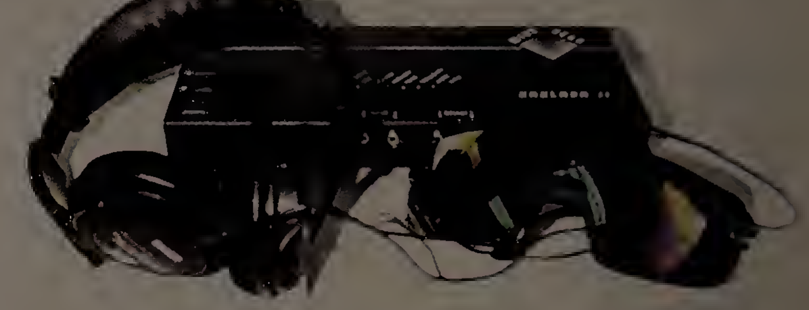
"In our high-pressure, time-driven, results-oriented society, we forget how precious downtime can be," says John Latz, a Moorseville, N.C.-based psychiatrist. "Sometimes, to help us relax, we reach out to devices. It's one way that we get a sense of control over our environment, and that helps to alleviate our stress."

Digital Diversions

Both the Mind Gear Inc. Personal Relaxer and I-O Display System LLC's Televizer Personal Display System were designed to help you relax by temporarily diverting your attention from the business world, stressful thoughts and other anxiety-producing situations. As a diversion technique, the Televizer gets top marks. For people who want to slow their thoughts (and maybe their pulse rate), Mind Gear's unit will help.

Both devices are representative of a select group of stimuli-exclusion products. Both create a sort of virtual reality by saturating two of your senses — sight and sound — helping isolate you from your environment by substituting pleasant for unpleasant stimuli. The downsides are cost, some learning time and the chance that someone might take you for a New Age couch potato. ◗

TELEVIZER gets top marks for diverting stress



XCELR8R II PRO PERSONAL RELAXER helps slow down intrusive thoughts

Televizer

I-O Display Systems LLC
www.i-glasses.com
$1,500, including a Panasonic P10 DVD player and carrying case.

Weighing just 8 ounces, I-O Display's Televizer is one of the niftiest toys around and a sure head-turner. The Televizer's image simulates looking at an 80-in. screen suspended 11 feet away. The image produced by the twin LCD displays is viewable in a variety of ambient light situations, but it lacks the crispness and rich color of a television.

To prevent motion sickness while watching action movies, the glasses leave a little space at the lower edge of the frame so viewers can relate to their physical surroundings. I didn't experience any headaches or vision problems.

The unit provides three to four hours of play time, about the length of two digital video disc (DVD) movies. According to I-O, the unit's primary purchasers are professionals (such as dentists), parents traveling with children and movie enthusiasts. Although pricey, Televizer can also serve as a private presentation device at trade shows or for training. The operative word here is "private." The headset includes adjustable, built-in earphones, and only the viewer can see its twin LCD panels.

The headset accepts input from VCRs, camcorders, televisions and DVD players. It works with U.S. (National Television Style Committee) video sources, which includes composite and S-video, as well as PAL, a popular European video standard.

XCELR8R II Pro Personal Relaxer

Mind Gear Inc.
www.mind-gear.com
$450, including carrying case

There's no magic in Mind Gear's black box and dark glasses, but it can reduce stress – if you help it to help you. I found that for the best results, you need to allocate 20- to 40-minute sessions several times per week.

Mind Gear's product helps the user achieve a serene state of mind. When I wore the device's glasses, I saw, through my closed eyes, synchronized patterns of flashing lights and listened to "white noise," mostly beeps that varied in frequency. With that high-tech assistance, I could more readily banish intrusive thoughts and reach a relaxed state more quickly.

The device's control box contains more than 50 preset programs to energize or calm its users, and you can create your own programs. The deluxe kit contained a single set of headphones and two sets of glasses: One uses colored LEDs, the other uses white LEDs. I preferred the white. The control box lets two users jack in at the same time, and both can receive the same program.

The unit's rechargeable batteries make it portable, so it's easy to take to a private area to eliminate interruptions. Unlike the Televizer, the Mind Gear unit does its best work for you if your mind, as well as your body, are isolated from your surroundings.

Millman is a freelance reviewer in Croton, N.Y.

TECHNOLOGYQUICKSTUDY

HOT TRENDS & TECHNOLOGIES IN BRIEF

Digital Wrappers

BY TIM OUELLETTE

DEFINITION

Digital wrappers are programs wrapped around another program or item such as an e-mail message. The wrappers act as multifunction gatekeepers to do things like encrypt and secure e-mail or control the enclosed program from running under certain circumstances.

SOON, MORE of the information we receive via the Internet could come packaged in digital wrappers.

Wrappers are made up of software code that's targeted to do specific things with the data enclosed within them, such as helping to define queries for search engines. They also keep outsiders from gaining access to that code.

Wrappers are most commonly built in to e-mail programs and attached to items like demonstration software or files downloaded from the Internet.

Those files, which can include a range of objects such as images or graphics on a Web site, can be downloaded only with permission from the Web-site owner or with a password or code.

Guarding the Gate

Wrappers help prevent software piracy and guarantee delivery of secure e-mail, which are two major concerns about the Internet today, says David Ferris, president of Ferris Research Inc. in San Francisco.

"Digital wrappers are basically multifunction gatekeepers," says Jim Halberston, an analyst at Zona Research Inc. in San Francisco. "The advantage of a digital wrapper is that you can not pull information off the wrapper that tells you about the message content inside."

The most recognized form of digital wrappers are digital envelopes. Those pieces of code are the workhorses of e-mail encryption, locking out intruders who don't have the right digital key to open the envelope. The digital envelope is essentially made up of code encrypted with a cipher, or software algorithm, and carries a digital signature that properly identifies the sender to the recipient.

To work well, digital envelopes require that a public key infrastructure is in place: Without the correct digital key to decrypt the wrapper, an intruder can't view the message inside.

But digital wrappers can perform other tasks that are becoming just as important.

Companies can ensure safe software distribution to remote locations by using digital wrappers to protect the program inside, requiring special codes or passwords to open the programs.

The software downloads, demos and updates offered via the Internet come with wrappers to unlock the programs. Software demos come with wrappers that install with the program, turning off its functions after a certain number of uses or after a designated time period.

For example, an organization such as a news provider could send online information such as photographs to another news organization for a fee. The wrappers could limit content to one use.

Branching Out

Wrappers originally protected software just once, but that's changed in the past year, with new generations of wrappers giving software providers more flexibility.

Beyond their primary role as gatekeepers, digital wrappers might start to play an important role in marketing and sales efforts for online vendors, Halberston says.

For example, a digital wrapper around a demo version of a product could warn the user that there are only a few more uses of the software left before it will shut off. The wrapper could also offer the user sales contact information, to buy the product immediately. ◗

Ouellette is a freelance writer in Scarboro, Maine.

Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@computerworld.com.

AT A GLANCE

More Than Protecting Postage

Uses for digital envelopes and digital wrappers include:

- Software distribution
- Product downloads from Web sites
- Image downloads and deliveries
- Fraud detection
- Protection of credit-card information during e-commerce transactions

Unwrapping the Code

How these security envelopes work within an e-mail package:

① A person writes an e-mail message, using features in his e-mail package to encrypt the message.

② The encrypted code is "wrapped" around the e-mail message, creating a digital envelope that can be opened only with a special digital key by the receiver.

③ When the message gets to its recipients, they use a digital key to open the envelope or unwrap the encrypted code to get at the contents of the message.

JOHN R. BRILLON

MOREONLINE

For more information about digital wrappers, visit our Web site.
www.computerworld.com/more

ALL OR NOTHING PROPOSITION

To get the most from Windows 2000, you'll need to upgrade your clients. Is it worth it?

By Cynthia Morgan

WHEN WINDOWS 2000 ships, older systems and applications are liable to be left behind. Customers who want to use Microsoft Corp.'s new operating system should be willing to sacrifice incompatible hardware and software or accept the fact that the best parts of Windows 2000 won't work.

Windows 3.x, 95, 98, MS-DOS and OS/2 clients won't take advantage of critical features such as Microsoft's new Active Directory global directory service. If information technology managers need those capabilities on the desktop, Microsoft generally has one solution: Upgrade to Windows 2000. The new operating system will balk at installing on top of non-Windows 2000-compliant hardware or applications.

Microsoft Senior Vice President Jim Allchin insists that IT departments' overwhelming need for reliability mandated what some might call the abandonment of a large, installed base of corporate PC users. "We hope we don't have to sacrifice too much compatibility," Allchin says. But "If it comes down to a hard trade-off, we'll come down on the side of reliability. Users just want reliable, simple computing," he says.

Generally speaking, hardware limitations will keep a large number of client PCs out of the Windows 2000 Pro arena. The new operating system isn't appreciably more hardware-hungry than Windows NT 4.0 Workstation, but it still requires substantially more horsepower than the Windows 9x PCs running on many corporate desktops. (see "10 Questions," page 82)

One solution, says Microsoft group product manager Ed Muth, is to run applications from the server using Windows 2000's enhanced Terminal Server. However, that will boost the server-processing load and further clog crowded networks.

If you don't upgrade a client on a Windows 2000 network, what key features will you miss?

Active Directory

This fills a crucial shortcoming in previous versions of Windows: the lack of a true global directory service. Under NT 4.0, administrators must repeatedly develop and maintain separate lists of users and resources for network services such as log-in authentication, messaging and Internet access. Active Directory consolidates all those lists, cutting the time and cost to manage a large network. Probably the most important feature of Windows 2000, Active Directory is the foundation for many other new features in the operating system.

"Active Directory, when it's in place, will be great," says Steve Sommer, CIO at law firm Hughes, Hubbard and Reed LLP in New York. Sommer's company has about 65 NT 4.0 servers and roughly 1,000 client PCs, all running Windows NT Workstation. "We don't have to have just one domain. Our clients are now requesting things from our system. From the accounting side, they want billing; they want to look at their billing [online]; they want us to be able to work on contracts immediately."

IntelliMirror

Under current versions of Windows, user configuration data is kept on the local computer, not on the server. Windows 2000's IntelliMirror lets users log on to any computer on the network and receive its entire personal configuration, including desktop and applications. IntelliMirror also makes it easier for network managers to define and maintain group configurations of applications and network resources.

Storage Management

Windows 2000's Remote Storage Services automatically monitors usage on local hard drives and can off-load infrequently used files to network storage to free up space.

Mobile Management

The new operating system enhances the rudimentary virtual private network found in Windows NT 4.0, making setup much easier for telecommuters. Windows 2000 also supports multiple network-connection methods without reconfiguration, so that users can easily move from an office network to a dial-up connection and extend the ability to synchronize files and Web pages for off-line work.

Hardware Support

Windows NT 4.0's dismal support for nonstandard hardware is legendary, and even Windows 98 has at times failed to adequately manage device recognition and power usage. Windows 2000 is Microsoft's first attempt at supporting the new advanced configuration and power interface specification, which has the potential to greatly improve hardware management.

Workstation Security

Moving to Windows 2000 on the server can improve overall enterprise security, compared with Windows NT 4.0. But Windows 2000 Pro gives added security to desktops by encrypting hard-drive data so that it can't be read by installing the hard drive on a new machine. The new operating system natively supports security measures such as smart-card authentication.

"The Kerberos security is a lot more effective [than what's in Windows NT 4.0] . . .," Sommer says. "The ability to quickly and securely link to outside business partners will be very important."

In some ways, Windows 2000 strictly enforces what Microsoft has found to be the best practices to keep servers and desktops running reliably. New Windows 2000 setup routines scan the system for potential incompatibilities and require they be resolved before installation can proceed.

Last year, Microsoft surveyed five companies running more than 1,300 Windows NT 4.0 servers with the then-latest service pack updates. It found IT management practices greatly influenced reliability, according to Allchin and Muth.

The highest client/server reliability occurred where managers performed extensive compatibility testing of any device or application before installing it on the network and enforced standard desktop configurations. Those that weren't as stringent in their control suffered up to five times the number of reboots and 10 times as many "blue screen of death" system crashes, Allchin says.

" Compatibility's always a concern . . ., but it always works out.

STEVE SOMMER, CIO,
HUBBARD AND REED LLP

SHONNA VALESKA

It's been widely reported that a sizable percentage of older applications either won't run properly or will block installation of Windows 2000. The worst offenders are the following:

- Dynamic Link Libraries (DLL). DLL programs supplement basic services offered by Windows. Normally stored in Windows system folders, they're especially memory-efficient because they're loaded into a computer's memory only when the application (or Windows) requires them.

Under older Windows versions, including 9x, there was little way to tell which DLL took precedence over others. Older DLLs may overwrite newer ones during software installations, or programs expecting to find old DLLs could behave erratically, fill up computer memory and/or crash, giving no clue about the cause of their behavior.

- Virtual Device Drivers (VxD). These bridge the gap between MS-DOS hardware and software and Windows, intercepting and translating communication between the two. They were supposed to be replaced by DLLs and other components as 32-bit Windows matured. Unfortunately, they've remained an easy way for time-pressed programmers to shortcut a tricky operation and still run very old applications and hardware.
- Terminate and stay resident (TSR) programs. TSR programs compensated for MS-DOS' inability to run more than one application at a time by placing small applications or utilities in the unused portions of the computer's memory. The memory managers in Windows have trouble coping with TSRs' unpredictable behavior.

Microsoft supplies some tools to overcome problems with these components. For example, its Migration DLL AppWizard helps Microsoft C++ 5.0 programmers isolate and migrate incompatible DLLs.

Another tool, Sysdiff.exe, troubleshoots test installations by taking a snapshot of changes to an application's files and Windows Registry settings when Windows 2000 is installed. Both are available on Microsoft's Web site, *msdn.microsoft.com/developer/windows2000/migration/default.asp.*

"Compatibility's always a concern . . ., but it always works out," Sommer says. "The vendors we use, including Microsoft, are testing on Windows 2000 right now. I've made sure the major [vendors] are testing out their applications and will be 2000-ready when we do it." ◗

10 QUESTIONS TO ASK ABOUT Windows 2000

1 Why Should I Upgrade My Windows NT Servers?

- For increased stability, performance and reliability
- For support of new I/O standards such as IEEE 1394, I2O and Fibre Channel
- For improved use of storage devices
- Because you need to scale past NT 4.0 limits
- It offers better security options than NT 4.0

2 Why Should I Upgrade My Clients?

- To take full advantage of Windows 2000 server features such as IntelliMirror, Active Directory and backup/restore capabilities
- To support new I/O standards such as IEEE 1394, I2O and Fibre Channel
- For improved network print services

3 What *Shouldn't* I Expect From Initial Windows 2000 Installations?

SERVERS:

- Full use of Microsoft Corp.'s Management Console remote management, software distribution and group policy services unless the entire network is upgraded to Windows 2000
- Full Active Directory support for Unix servers; one-way sync and migration tools will be available

CLIENTS:

- The ability to take advantage of remote management features that require "instant on" low-power states not found in older desktops
- Complete power management and Plug and Play "hot-swapping" support, particularly for older notebooks and devices
- Support for very old devices and applications

4 What Windows Systems Can Be Migrated to Windows 2000 Immediately?

- Windows NT 4.0 Workstation machines with Service Pack 3 and euro and year 2000 updates
- Standard Windows NT Server installations on network servers

5 Which Windows Machines Should I Delay Migrating to Windows 2000?

- Client PCs more than 2 years old without extensive (including BIOS) upgrades
- Any Windows 95/98 machine that must run custom applications or those not listed on Microsoft's Windows 2000 READY Application Catalog
- Machines running the earliest Windows versions (Windows 3.1x, Workstation 3.x, etc.) because of probable hardware resource problems
- Machines that must host devices known to be incompatible or that don't appear on Microsoft's Hardware Compatibility List

6 How Far Will the Windows 2000 Server Editions Scale?

- Memory: Windows 2000 DataCenter will support up to 64G bytes of memory on Intel Corp. or Compaq Computer Corp.'s Alpha platforms using Intel's Physical Address Extensions
- Processors: 16-way RISC or Intel processing for DataCenter, four-way processing for Advanced Server, two-way for Server; up to 32-way processing will be available from third-party vendors
- Clusters: Eight CPUs/systems can be clustered in Windows 2000 Advanced, 32 in DataCenter, up to 64 using third-party add-ins
- Storage: Up to 17K terabytes of data

7 What PC Resources Are Needed To Run Windows 2000 Pro On the Desktop?

BARE MINIMUM:

- 200-MHz Pentium or Alpha or better with at least 128K L2 cache (older Celerons may have problems, for example)
- 64M bytes of RAM
- 2G/900M bytes free on hard drive

FOR BEST PERFORMANCE WITH FOUR TO SIX OPEN APPLICATIONS:

- 300-MHz Pentium II or Alpha machine
- Microsoft-certified BIOS
- 128M bytes of RAM
- 8G-byte hard drive
- Windows 2000-ready network interface card
- Clean install from scratch, not an upgrade

8 What PC Resources Are Needed to Run Windows 2000 Pro on Mobile Clients?

- Best support will come on new notebooks that include OnNow power management, Advanced Configuration and Power Interface
- Older laptops (generally those purchased with Windows 95) may have significant problems with Windows 2000 power management; check manufacturers' Web sites for instructions and/or BIOS updates

COMPUTERWORLD RECOMMENDS:

- 233-MHz Pentium II or better (mobile processor versions)
- 64M bytes of RAM or more
- 6G-byte hard drive (or higher)
- Windows 2000-certified power management

9 What Will I Need To Do To Run Windows 2000 Server Editions?

- Generally speaking, existing Windows NT 4.0 servers with the latest service-pack updates should have the fewest migration problems
- You'll probably need to replace network interface cards with Windows 2000-certified versions
- If you're already using devices that require IEEE 1394, I2O and Fibre Channel, check the manufacturers' Web sites for potential compatibility problems and upgrades
- Custom, line-of-business applications, third-party network management tools and Windows NT 4.0 utility add-ons will require extensive testing before Windows 2000 deployment

10 Is There a Firm Release Date for All Windows 2000 Products?

- Beta 3 will be in the hands of 500,000 customers by mid-May
- Microsoft promises to ship at least three of four versions, Windows 2000 Pro, Server and Advanced Server, this year; the target date is October. Windows 2000 Data Center will ship about 90 days later ▶

The Promise of Packet Switching

BY MARY BRANDEL

THE TIME: The mid-1960s. The place: The National Physical Laboratory (NPL) in England. Donald Davies, superintendent of the computing sciences division at the NPL, was studying the concept of time-sharing. He began to realize the inadequacies of the data communications capabilities of the day. Unlike phone calls, where you needed an established circuit with a fixed bandwidth for the duration of the conversation, computer communications were more bursty, with long periods of inactivity.

Meanwhile, Rand Corp. in Santa Monica, Calif., had been asked several years earlier by the Advanced Research Projects Agency (ARPA) to develop a communications network that could survive a nuclear attack. "It was the height of the Cold War, and any attack by the U.S.S.R. would also take out the total U.S. telephone system by its collateral damage — and we would be without military communication," says Paul Baran, who was instrumental in developing the ideas for the network at Rand. The phone system was so highly centralized that if even a small portion of the main plant were physically damaged, all long-distance communication would be blocked.

Two men, two very different projects. But Baran and Davies reached strikingly similar conclusions. Independently, both developed the concept of what we now know as "packet switching," a term Davies coined in 1965. Baran's term was "distributed adaptive message block switching." As he put it, "Davies chose a wonderful name."

Packet switching breaks big chunks of data into smaller units, called packets. The packets are transmitted individually using the fastest route available on the network. Each packet holds information about its origin and destination. Once all the packets arrive at the destination, they're recompiled into the original message.

With regular telephone service, which is based on circuit switching, transmissions are sent serially over a dedicated line. By comparison, packet-switched networks are more resistant to failure because only problem packets need to be retransmitted, not entire messages. Plus, if packets run into downed computers or cut lines, they find another path.

LOUIS FABIAN BACHRACH

PAUL BARAN says the initial response to his packet switching idea was, "The kid's crazy"

Packet switching is also cheaper because you can build networks out of less reliable parts because the overall system is far more reliable than any of its pieces, Baran says. No wonder most network protocols today, including TCP/IP, X.25, and frame relay, are based on packet switching.

Despite the similarities, the work of Davies and Baran took very different routes. Baran described his ideas in a landmark 1962 report, "On Distributed Communications," and then spent the next few years defending it. AT&T Corp., for one, was opposed to the idea of packet switching — particularly because it required a digital network, Baran says. AT&T, which had a communications monopoly at the time, didn't welcome the competition brought by a digital provider. Plus, the vendor had only experimented with digital technology and didn't have much experience with it, he explained.

"The initial response was, 'The kid's crazy. It couldn't possibly work,' " Baran says. "At one of the early meetings with AT&T, one of the older guys said, 'Wait a minute, son. Did you say you opened the switch before the transmission got all the way across the country?' And he started explaining to me how the telephone worked. It's pretty hard for a guy who spent his whole life with analog to comprehend or take [digital] seriously."

The big break came in 1966. That was when two of ARPA's program directors, Robert Taylor and Lawrence Roberts, decided to build a network connecting all of the agency's universities and research-and-development firms. "They could have done it with centralized time-sharing, but they chose packet switching," Baran says. The result — the Arpanet — laid the foundation for today's Internet.

1965

Meanwhile, back in England, Davies in 1965 dreamed of creating a national packet-switched network that would provide low-cost data communication across the U.K. However, with much less funding than the $20 million Arpanet project, he had to limit his work to a prototype network with a single switching node at the NPL. That network was completed in 1969 and lasted until 1986. Davies also gave lectures on packet switching, including one in Gatlinburg, Tenn., where ARPA's Roberts first became excited about the idea.

Did it take two great minds to make packet switching the most prominent network transport method available? Or was it inevitable that someone, somewhere would arrive at the concept? Baran isn't surprised that two minds thought alike. "There are only so many ways of doing this," he says. ◗

Brandel is a frequent contributor to Computerworld. *Contact her at brandel@cwix.com.*

Technology Happenings

- **IBM** releases a time-sharing machine, the **S/360 Model 67**, and matching operating system, **TSS/360**.
- **Harvard University** and **MIT** introduce computer-dating services.
- **Digital Equipment Corp.** introduces the **PDP-8**, the first mass-produced minicomputer. The machine drives down computing prices, triggers new application development and helps to spawn the reseller industry, in which companies embed the computer into another system and resell it.
- **General Electric Co.** introduces the **GE-115,** a general-purpose computer designed for small data processing applications.

In Space

- **March: Soviet** cosmonaut **Alexei Leonov** becomes the first person to walk in space. The first two-person U.S. space flight, **Gemini III**, blasts off from Cape Kennedy, carrying astronauts **Gus Grissom** and **John Young**.
- **June:** During the flight of **Gemini IV**, **Edward White** becomes the first American to **walk in space**.
- **August: Gemini V,** with astronauts **Gordon Cooper** and **Charles "Pete" Conrad** aboard, splashes down in the Atlantic after eight days in space.
- **December:** Two manned U.S. spacecraft, **Gemini VI and VII**, maneuver to within 10 feet of each other while in orbit.

Born in 1965

- **Michael Dell, Dell Computer Corp.** chairman and CEO
- **Jesse Jackson Jr.**, Democratic representative from Illinois and the **Rev. Jesse Jackson**'s son
- **Reggie Lewis, Boston Celtics** star; died in 1993

Other Notables

- **The Beatles** play a sold-out concert at **Shea Stadium** in New York.
- **Best Picture:** *The Sound of Music*
- **The New York Jets** sign University of Alabama quarterback **Joe Namath** for a reported $400,000.

- Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

Civil rights leader Malcolm X is assassinated in Harlem.

President Johnson signs the Medicare Bill, to take effect in 1966. He also announces an increase in troops in South Vietnam, from 75,000 to 125,000.

President Johnson signs the Voting Rights Act.

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

Ferdinand Marcos becomes president of the Philippines.

The Rev. Martin Luther King Jr. leads 25,000 protesters from Selma to Montgomery, Ala., to protest the denial of voting rights to African-American citizens.

Davis Miller becomes the first person arrested on a charge of burning a draft card.

Bob Young
Chairman & CEO,
Red Hat Software
Kickoff Keynote
Thurs. May 20

Jim Gettys
Co-author X Window System
Technical Keynote
Thurs. May 20

John Paul
VP, Server Product Division
Netscape Communications
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Fri. May 21

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Manufacturing's Moods

Demand for IT skills varies at some of the manufacturing industry's top companies

By Steve Alexander

WHETHER information technology in manufacturing is different from other industries depends on whom you ask. Light appliance and food manufacturing use mostly generic IT skills; heavy industries such as steel have the most specialized requirements. For a take on the current job markets, we asked five industry CIOs for their views on salaries, background experience and what makes the work appealing.

Harley Davidson Motor Co.

"What makes manufacturing IT special is that you actually can touch and feel the product. You can ride a motorcycle; you can't ride an investment portfolio," says Cory Mason, director of Information Services at Harley Davidson Motor Co. in Milwaukee.

Manufacturing systems reflect the idea of an empowered workforce with near-universal access to information. "One of the things we recently put in is what we call our Corrective Action Request System, which uses Lotus Notes," Mason says. "When we find an issue related to manufacturing, it goes into Lotus Notes. But anybody has the ability to view that file or update it or close it."

Harley Davidson also plans to enable "manufacturing cells," or subunits of manufacturing lines, to communicate directly with outside parts suppliers via the Internet. The cells will also communicate with internal product design teams via the company intranet. The firm, which has 180 IT people, hired 35 last year and plans to hire 25 more this year. Some of the people being sought are systems integrators, Web developers and network administrators. The most difficult workers to hire are systems analysts with three to five years' experience, Mason says.

"When we can't hire the IT skills we need, our proclivity is to hire people who have the soft behavioral skills we want. If they're light in technical skills, we think we can augment that," he says.

CHRISTOPHER BALDWIN/SIS

Bethlehem Steel Corp.

Thomas J. Conarty, director of IT at Bethlehem Steel Corp. in Bethlehem, Pa., says the following three skills characterize IT in heavy manufacturing:

- The need for software that can provide subsecond responses to precision manufacturing machinery.
- Expertise in different types of data storage. "If you're making a piece of steel, you retain certain information about that part for a long time, but information about movements of a valve or motor may be retained only for a short period," Conarty says.
- Writing application code that incorporates safety features. Software might be designed so that in the event of a computer failure, steel-making equipment would be halted in positions that wouldn't injure any workers.

Bethlehem Steel is seeking people with C++, Fortran, Unix and database skills — and particularly wants people with a combination of IT skills and experience in other engineering disciplines, such as mechanical engineering. The firm has about 150 IT employees and has outsourced about 500 other IT jobs to Electronic Data Systems Corp. About 40 people were hired for the combined workforce last year, and slightly fewer will be hired this year, Conarty says.

Shop Talk

Skills earning the highest salary premiums, according to IT hiring managers in manufacturing shops:

INDUSTRY	SKILL	SALARY PREMIUM
Automotive	Progress	37%
Hardware/software/peripherals	E-commerce	24%
Food/beverage	Baan	35%
Electrical	Lotus Notes	15%
Construction products	Gupta SQL Base	100%
Metal/plastic/rubber	Sybase SQL Server	28%

SOURCE: COMPUTERWORLD'S 1998 SKILLS SURVEY

Good job assignments, intellectual stimulation and skills growth, not retirement benefits, are the keys to recruiting young, mobile IT workers, Conarty says. "Their mind-set is employable for life, not employee for life," he says.

Maytag Corp. and Whirlpool Corp.

These light manufacturing firms share similar turnover rates but have slightly different views of the manufacturing industry's IT pay structure.

"We feel our IT salaries are very competitive and believe our 6% annual turnover rate reflects that," says Edward Wojciechowski, corporate vice president of IT at Maytag Corp. in Newton, Iowa. His IT department, which has 300 people, hired 20 workers last year and expects to hire about 18 more this year.

But David Butler, corporate vice president and CIO at Whirlpool Corp. in Benton Harbor, Mich., says manufacturing firms don't pay the top IT salaries. They pay either in or just below the top quartile of the IT range, he says. Annual turnover of Whirlpool's 1,200-employee IT staff is 5% to 7%.

Butler says the most difficult skills for him to hire are SAP, Oracle database and C++.

Maytag is seeking AS/400 programmers. "Not having a manufacturing background is not necessarily a disadvantage," Wojciechowski says.

Manufacturing IT also offers the incentive of travel, Wojciechowski says. "We've got 14 plants scattered all over the country, and we can provide an opportunity for IT people to visit the sites," he says.

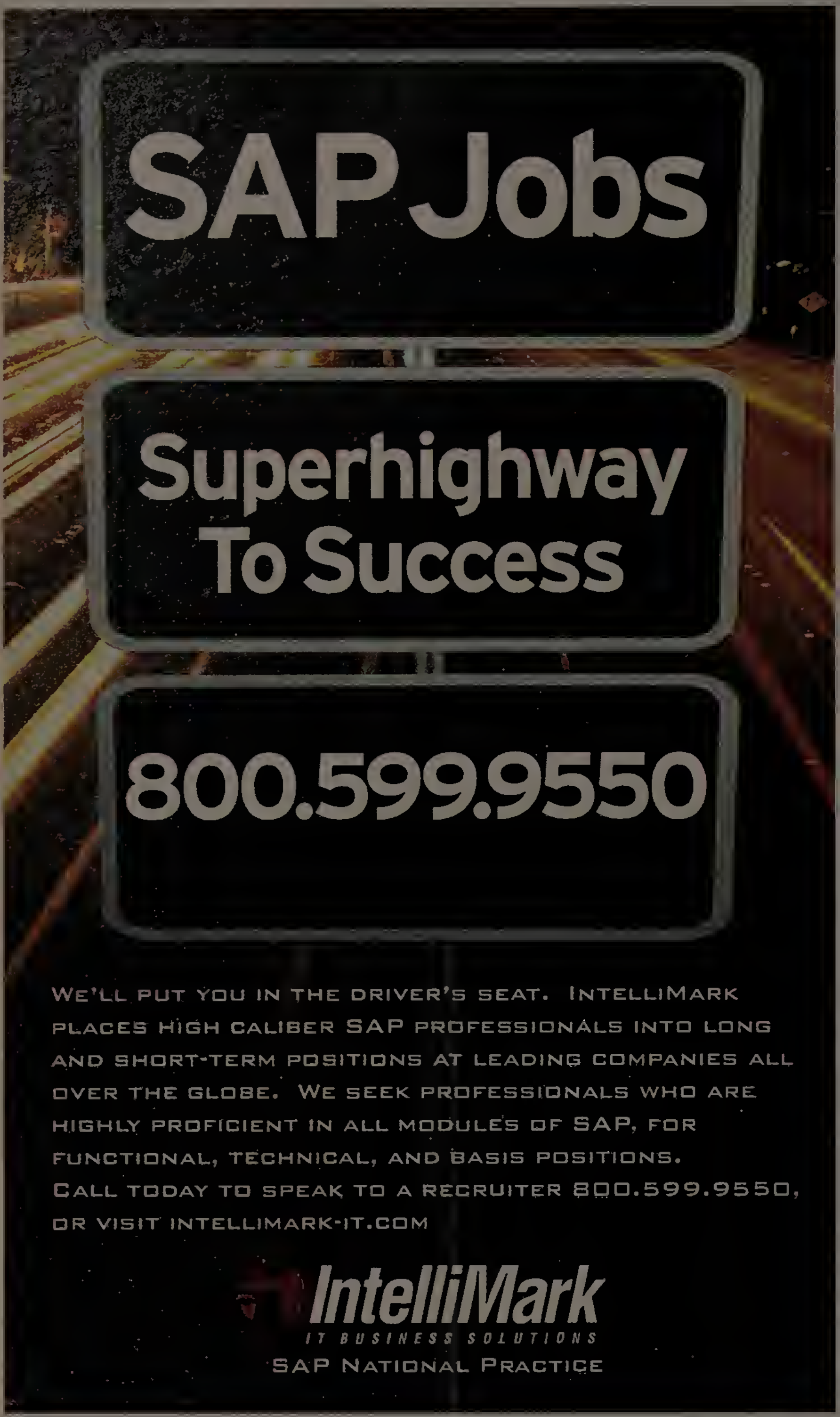
Nabisco Inc.

Experience in the food industry isn't the key to joining IT or IT management at Nabisco Inc.; only about half of IT workers have such a background, says Tony Del Duca, the firm's vice president of logistics and manufacturing systems in East Hanover, N.J.

Nabisco needs people with IT and mathematical backgrounds who can build computer models to track manufacturing capacity, component costs and transportation planning. Those models "measure different combinations of options to get the lowest cost," Del Duca says.

Del Duca has been looking to hire people with Visual Basic skills and Oracle or SQL database expertise. Nabisco has 570 IT people, including 130 who report directly to Del Duca. He hired about 10 people for his group last year and said he expects to hire the same number this year. Among the firm's big IT projects is the installation of SAP. The firm uses AS/400, RISC/6000 and NT Workstation technology. ▶

Alexander is a freelance writer in Edina, Minn.



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LAN Administrator - Design, support & implement PC/Data Access Control System (PC/DACS), Domain DACS & Netware 4 (with Netware IP). MUST HAVE: Bachelor's Comp. Sci., Engineering or Electronics Tech. 1 yr, 6 mos. exp. in job offered or 1 yr, 6 mos. as Network Analyst or Network Engineer. Exp. need only involve PC/DACS. Bachelor's degree may be substituted with 3 yrs of coursework & an additional 3 yrs of exp. 9-5, 40 hrs/wk, $45K. Send resume to Dept. of Labor/Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869, Attn: L. Knight, Re: JOFL # 1911956. Job location: Boca Raton, FL.

SOFTWARE ENGINEER to design, develop, implement, integrate and test various components for telecom application software systems using object oriented techniques (OMT), C + +, CORBA, Rogue Wave libraries, Rogue Wave tools.h + +, xdb, dbx, shell scripts, Sun Workshop, purify, quantify, make and System V IPC on HP-UX and Sun Unix platforms. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field; Must have a demonstrated ability to perform the stated duties gained through previous work experience / academic coursework and projects; Extensive paid travel on assignments to various client sites within the U.S. is required. Salary: $77,000 per year, 8:00 am to 5:00 pm, M-F. Apply by resume to: Roz L. Alford, CEO, A.S.A.P., Co., Inc., 3495 Buford Hwy., Duluth, GA 30097; Attn: Job VM

Interactive Programmer/Designer: Plan, design, build, program & integrate multimedia applications to support corporate communications, business units & diskette/CD ROM/kiosk production; direct & coordinate multimedia productions; consult w/clients regarding hardware configuration & software tools for desktop publishing, multimedia authoring & multimedia delivery platforms. M-F 40 hrs/-wk, 57K/yr. Must have Masters & 6 mo exp. w/interactive programming w/CD ROM & WWW site devl'pmt, be fluent in English, HTML, JAVA, Perl, SQL, C/C++, Visual Basic, mTroplis, Director, Lingo & Xtra devl'pmt, 2D/3D graphic design, Electric-Image, Protools & Strata Studio. Send 2 copies of resume to Case #80902, P.O. Box 8968, Boston, MA 02114

Two Full-time System Analysts to analyze user requirements, procedures, and problems to automate processing or to improve existing computer system. Responsible for designing applications for the company and its clients. Help clients create applications on the Desktop environment and lead a team to develop methodologies. Develop source code using various versions of Clipper Software that has a proprietary database interface. Convert some of the current applications to client server technology using Delphi. Must have four years of experience in the job offered or four years of experience as a Programmer or Programmer Analyst. Salary $58,100/yr. Send resume to: Raj Shekaran at Software Research Associates, Inc., 2nd Floor (Suite #2), 34-36 Maple Street, Summit, New Jersey 07901.

SENIOR SYSTEMS ANALYST - Analyze, design, create, develop & maintain comp programs, applications & bridges for systems and Dbase using Oracle & Sybase. Write, report & advise on functional & programming specifications, data dictionary using SQR codes. Req'd MS in Com. or Eng & 1 yr exp. Please send resume to Attn: J. Harz, Navisys, Inc., 499 Thornall St., Edison, NJ 08837. Fax: 732-548-4340.

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SOFTWARE ENGINEER to design, develop, test, implement, maintain and support client/server application software using Visual Basic, Active-X, COM/DCOM, Java, Javascript, Oracle and SQL Server on Windows NT and UNIX platforms. Require: M.S. degree (or equivalent) in Computer Science, or a closely related field, with two years of experience in the job offered. A B.S. degree with five years of progressively responsible experience will be considered equivalent to an M.S. degree. Extensive paid travel on assignments to various client sites within the U.S. is required. Salary: $65,000 per year, 8 am to 5 pm, M-F. Send resume to: Raghavendra Kulkarni, President, Pro Softnet Corporation, 3235 Satellite Blvd., Bldg. 400, Suite 300, Duluth, GA 30096; Attn: Job SJ

Two Full-time Systems Analyst Consultants responsible for design and development of software applications for the company and its clients. Assisting clients in state-of-the-art client server technologies under UNIX and Windows NT environment. Responsible for writing code in Visual Basic and C using the Object linking and embedding technologies (OLE) which is used to transfer data between the source and other external applications. Responsible for design and development of the database interface between the client application and backend Server database that is running Oracle or Sybase, using Open Database Connectivity (ODBC). Must have two years of experience in the job offered or two years of experience as a Programmer. Salary $58,100/yr. Send resume to: Raj Shekaran at Software Research Associates, Inc., 2nd Floor (Suite #2), 34-36 Maple Street, Summit, New Jersey 07901.

SOFTWARE ENGINEER to design, develop, test, implement, maintain and support software for financial and accounting applications in a client/server environment using Visual Basic, PowerBuilder, Delphi, Visual C + +, C/C + +, PL/SQL, Oracle, SQL and imaging tools under Novell Netware, Windows and UNIX operating systems. Require: Master's degree (or completion of all requirements) in Computer Science, Information Systems, or a closely related field; Must have demonstrated ability to perform the stated duties gained through previous work experience/academic course work. Salary: $58,728 per year, 8:00 am to 5:00 pm, M-F. Apply by resume to: Kurt Smith, H.R. Manager, McKesson HBOC, Inc., 10101 Claude Freeman Drive, Charlotte, NC 28262-2337; Attn: Job YB

PROGRAMMER ANALYST. Forty hours per week. 9 AM to 5 PM, Monday through Friday. Salary is $40,248.00 per year. Job located in Largo Lakes, Florida. Requires a four year Bachelor's Degree in Computer Science, and two years experience in the job offered. Duties include implementation and configuration SAP R/3 System Module "SD", implementation of the application (VP Link) under an SCO Unix 5.0 Platform. Maintenance and performance tuning of the new release. Implement (accelerated requirements methodology) sessions to assist project "customers" and "suppliers" to cooperatively discharge their joint responsibility to meet the needs of the business and document the "customers" information requirements, for new integrated solution package systems implementations. Send resume to: Department of Labor, Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869, Attn: M. Barnes, RE: JOFL#1937059. Equal Opportunity Employer.

Database Design Analysts (2) (Atlanta). Design logical and physical databases applying knowledge of distributed database design utilizing Oracle Designer 2000 and Powerbuilder design tools; develop data models describing data elements; analyze project requirements to estimate time and cost within project constraints; attend specification meetings to determine project scope and limitations; create database management system (DBMS) for defining, creating, revising, and controlling database utilizing knowledge of Oracle and Sybase DBMS's; determine and enter changes to data dictionary; and write physical database descriptions and logical databases utilizing C++ and SQL languages. A.S. degree or equivalent in MIS, Business, Math, or other. 2 yr. Experience. $45,000/yr. Send resume to: Terran Technologies, 4053 Howell Ferry Road, Duluth, Georgia 30096.

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Responsible for planning conducting, and providing leadership in design/development of software products in multiple areas. Requires a Bachelor's degree or equivalent work experience in Computer Science, Math, Engineering, or related field; a minimum of 6 years' experience in programming/software analysis; and a minimum of 2 years' experience with C/C++, Visual Basic, Powerbuilder or Case Tools in Windows NT. Several positions available.

SENIOR SOFTWARE ANALYSTS

Responsible for planning and conducting complex programming/software assignments in development of company products in multiple areas. Requires a Bachelor's degree or equivalent work experience in Computer Science, Math, or Engineering; a minimum of 3 years' experience programming /software analysis; and a minimum of 1 years' experience with C/C++, Visual Basic, Powerbuilder or Case Tools in Windows NT. Several positions available.

SYSTEM AND SENIOR SYSTEM CONSULTANTS

Candidates will act as technical expert in system integration or project management, integrating hardware, software and networking systems at customer sites. Requires a Bachelor's degree or equivalent experience in engineering or related technical discipline as well as a minimum of 8 years' related experience. Senior positions require a Master's with a minimum of 8 years' experience, or a Bachelor's with a minimum of 10 years' experience, or a Ph.D. with a minimum of 4 years' experience. Several positions available.

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Responsible for writing/setting up test environments for verifying company's hardware products. Requires a Bachelor's degree in Engineering or technical discipline or equivalent work experience; and a minimum of 3 years' experience in testing and development. Several positions available.

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Responsible for monitoring sales activities of Latin American sales specialists for digital media products. Requires a Bachelor's degree or equivalent experience in Computer Science or related field; a minimum of 4 years' computer sales experience; a minimum of 2 years' experience in computer graphics systems sales; and excellent communication/presentation skills in English/Spanish. Position available in Florida.

SENIOR SYSTEMS ENGINEERS

Responsible for determining design specs or large information systems. Requires a Bachelor's degree or equivalent work experience in Computer Science, Engineering, or related field as well as a minimum of 5 years' experience in software development lifecycle and application for GIS. Several positions available.

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Senior Systems Analyst to perform complex and critical systems analysis tasks on SAP (Systems, Applications and Products in Data Processing) systems including R/3 Basis Production, planning, including installation, implementation, trouble shooting, resolving technical problems, working out software modifications to suit client requirements at various client locations; to maintain close liaison with SAP computer scientists and engineers to work out software modifications using related computer hardware and applications software. Need Bachelor's or equivalent in Computer Science and two (2) years experience, including knowledge and experience in SAP systems including SAP R/3 Basis and related hardware and software applications. The qualified applicant can work from his/her home. Travel to client sites required. The job site is in Stamford, CT. Salary is $85,000.00 per year. If qualified send resume and cover letter documenting minimum qualifications to: Attn: Job Order # 3234815, Program Support - 3rd Floor, Connecticut Department of Labor, 200 Folly Brook Boulevard, Wethersfield, CT 06109. Applicants will be required to present proof of legal authority to work in the United States.

SOFTWARE ENGINEER to design, develop, analyze and support engineering applications using internally developed, data driven, client/server, 4th generation language application development environment consisting of cross-platform functional engines, operating system interfaces, database management system interfaces, terminal manager interfaces and network communication interface; convert scientific, engineering and other technical requirements into software system specifications which conform with pre-existing system constraints; research, design, analysis, development, testing, maintenance, porting and support of all system software, applications and networking software and Graphical User Interfaces, databases and ISO based product data exchange software using PERL, C, C++, X-Windows/Motif, Java, JDK, HTML, UNIX shell scripts, SQL, 4th generation languages and other development tools running on Solaris, HP-UX, SINIX, AIX, Netware, Windows NT, MS-DOS, MS-Windows, Windows 95/98 environments in batch and on-line modes for standalone, networked and client/server environments incorporating TCP/IP and UDP protocols and BSD/WinSock sockets; test and debug software using Turbo Debugger, dbx, xdb and Microsoft Visual C++ debugger. Require: M.S. in Computer Science and two years experience in the job offered or as Systems Analyst (experience gained before or after obtaining M.S. is acceptable). Salary: $58,000 per year, 40 hours/week, 8 am to 5 pm, M-F. Send resume to: President, Integrated Support Systems, Inc., 934 Old Clemson Highway, Seneca, SC 29672 (Rel. RS99).

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Applications will be accepted until the position is filled. Send a detailed resume, three letters of reference, and academic transcripts to Professor James E. Goldman, Code CW, Department of Computer Technology, Purdue University, 1421 Knoy Hall of Technology 242, West Lafayette, IN 47907-1421. Questions should be directed to Professor Goldman at (765) 494-9525 or via e-mail at jegoldman@tech.purdue.edu. Visit us on the web at http://tech.purdue.edu/cpt/. Purdue University is an equal opportunity, affirmative action employer.

SOFTWARE ENGINEER: Software design and development using the Sybase SQL Server system and Oracle under Windows NT. Programming in C++ and PowerBuilder. EDUCATION: Master's degree in Math, Computers or Engineering OR in lieu of Master's degree, will accept Bachelor's degree plus five years of work experience. WORK EXPERIENCE: One (1) year, zero (0) months as Software Engineer performing the duties as described above, OR one (1) year, zero (0) months related occupation experience as a Programmer Analyst, OR one (1) year, zero (0) months related occupation experience in Systems Engineering. HOURS AND SALARY: 40 hours per week, 8:00 a.m. to 5:00 p.m.; $70,561.92 per year. Apply at the Texas Workforce Commission, Dallas, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701, J.O.# TX0611822. Ad paid by an Equal Opportunity Employer.

DATABASE ADMINISTRATOR: Database Administrator to do logical and physical design of Oracle database; Code test and implement Oracle scripts applying knowledge of Database Management Systems; Calculate optimum values for Oracle database parameters; performance tune Oracle databases; Model Oracle database security; manage backup and recovery of Oracle databases; make changes to Oracle database applications using expertise in Oracle database administration which includes logical design, physical design, performance tuning, backup and recovery, coding of scripts, knowledge of Oracle 7.3, SQL *DBA, Pro *C (tools) and PL/SQL (Language). Requirements: Bachelor's Degree in Computer Science or related field and two years experience as a database administrator or computer programmer, expertise in Oracle database administration which includes logical design, physical design, performance tuning, backup and recovery, coding of scripts, knowledge of Oracle 7.3, SQL *DBA, Pro *C (tools) and PL/SQL (Language). Salary: $57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and relocation. Apply: Mr. Terry N. Faust, Greene County Job Center, 653 East High Street, Waynesburg, PA 15370, Job No. 8049041.

Programmer Analyst: Design, develop & customize financial package systems such as payroll, general ledger & project costing using PeopleSoft, Oracle, PowerBuilder & OLAP tools for datawarehousing in a client server environment. Responsible for project management & for providing end-to-end PeopleSoft solutions to the PeopleSoft database applications. Develop applications for large scale on-line transactions for the Internet & Intranets in accordance with common user access standards & object oriented principles. Some projects may be performed at client sites in various geographic locations requiring travel to &/or temporary placement at a client site. Must have a Bachelor's degree in Computer Information Systems. Must have at least one year of experience in the job offered. 40 hrs/wk, 8:00am - 5:00pm. $85,000/yr. Overtime required as needed at $45.00/hr. Must have proof of legal authority to work permanently in the U.S. Send resumes to the ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois 60605. Attention: Leila Jackson. Reference # V-IL 20202-J. AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

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PORTING ENGINEER (Lisle, IL). Design, develop, compile, & customize code for OpenIngres relational database, Jasmine Object Oriented database & associated tools utilizing programming languages C, Assembler, Visual C++ & C-API for various UNIX platforms & Windows NT to run efficiently on specific third party vendors' computers. Test customized products under various UNIX platforms utilizing knowledge of UNIX sys admin to ensure both single & double byte features & efficient disk space mgmt. Prepare product for production including platform specific documentation, internal documents & archival of customized source code. Req's Bachelor's in Comp Sci or related field & 1yr exp in job offered or as Quality Assurance Techn or Applications Programmer. 1 yr exp must include working with OpenIngres, programming in C & Visual C++, UNIX sys admin & Windows NT. 40 hrs/wk, 9:00-5:00, M-F, $56,560/yr. Must have proof of legal authority to work permanently in the US. Send resumes to: Illinois Dept of Employment Security, 401 South State St. - 7 North, Chicago, IL 60605. Attn: Shella Lindsey, Ref #V-IL 20232-L. An employer paid ad. No calls-Send 2 copies of both resume & cover letter.

Programmer Analysts - Unisys Computers: Analysis, design, develpm't, implementation & maintenance, of online & batch-oriented business applications in a multi-software/multi-hardware environ. incld'g Unisys 1100/2200, A-series or V-series mainframes using database systems, Third & Fourth Generation languages (3GLs & 4GLs), data mgmt software utilities & tools. Req: B.S. computer science - math/engr'g/science/Business-commerce; (or equiv.); 1 yr exp. in job or 1 yr as prog'r analyst/systems analyst; Must have appropriate combination of skills as follows: 1 of A & 1 of B & 1 of C; or 1 of A & 2 of B; or 2 of A & 1 of B as follows: A) DBMS: DMS 1100, RDMS 1100, DMS II; B) Tools/Languages: DPS 1100; TIP, LINC II, COMS/GEMCOS, ALGOL, LDA, MAPPER, COBOL; C) Software: USAS. High mobility preferred (multiple positions). 40 hrs/wk; $56,615 - $75,000. Report/submit resume to Ms. Joan Lang, Pittsburgh West Job Serv., 320 Bilmar Dr., Pittsburgh, PA 15205. JO #2024670.

Systems Analysts to analyze user requirements, procedures and problems to improve existing computer systems and software. Confer with user personnel to analyze current operational procedures, identify problems, and learn specific input and output requirements. Write detailed descriptions of user needs, program functions, and steps required to develop or modify computer programs. Review computer systems capabilities to determine if requested program or program change is possible within existing system. Evaluate effectiveness of existing information processing systems. Study development of new information systems to meet current and projected needs. Plan and prepare documentation of the program development. Upgrade systems and correct errors to maintain system after implementation. Bachelor or equivalent in Computer Sc. plus two yr. exp. in job offered or two yr exp as Programmer req. Salary $54,000/yr. Job site: various unanticipated sites throughout the U.S. Employer location: Pittsburgh. Send resume to Job #2024673, Office Manager, Pittsburgh South Job Center, 2100 Wharton Street, Pittsburgh, PA 15203.

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ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7th North, Chicago, Illinois 60605. Attention: Brenda Kelly Reference # V-IL 20027-K. AN EMPLOYER PAID AD NO CALLS - SEND 2 COPIES OF BOTH

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Digital Signal Processing (DSP) Software Engineer that will develop and fine-tune digital signal processing techniques to process speech driven wireless messaging gateways focusing on voice waveform compression, decompression, recording and playback; evaluate and implement algorithms for speech signal analysis and synthesis using Fast Fourier Transform techniques and spectral analysis; for transmission purposes, develop, evaluate and implement data image compression and decompression algorithms; evaluate algorithms changes and improvements; conduct voice quality improvements analysis and algorithm refinements using simulation of actual algorithms in MatLab; using the C programming language and some low-level Assembly in a UNIX environment, design digital signal processing software to operate in a real-time or near-real-time embedded environment; research and streamline the compression/decompression of facsimile binary images; develop digital signal processing software for data compressions; evaluate vendor speech recognition software; responsible for project accountability, including schedules, designs, and manpower analysis. Must have a Master's degree in Electrical Engineering or Computer Science/Engineering. Two years experience required as a Digital Signal Processing (DSP) Software Engineer or two years experience as a Research Assistant &/or Software Engineer &/or DSP Engineer. Academic or practical experience must have included: i) developing, evaluating and implementing algorithms for speech signal analysis and synthesis including the use of Fast Fourier Transform techniques and spectral analysis, and ii) developing, evaluating and implementing data image compression and decompression algorithms. 40 hours per week, 8:00 a.m. to 5:00 p.m., $63,190.40 per year. Apply at the Texas Workforce Commission, Fort Worth, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701, J.O. # TX 0611245. Ad paid by an equal opportunity employer.

Software Engineer (San Diego, CA; Pittsburgh, PA & other client sites) Research, analyze, design, re-engineer, & develop application progrms for client's systems & subsystems. Prepare documentation; provide technical support. Environment: Minicomputers running Unix op. system; Oracle; PowerBuilder. Master's in Comp. Sci/Math/Engg + 2 yrs exp. in job off'd or Programmer/Analyst. $66,892/yr, 40 hrs/wk, 8-5. Send resume to JO# 7048891; Mr. Ron Marsh, Mgr., Alle-Kiski Job Ctr., 3 Kensington Square; New Kensington, PA 15068.

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Software Consultant (J.O.N. 1024622), Consult with client to define its electronic data processing needs and problems; conduct study to obtain and analyze data on client's EDP requirements; determine custom software solutions and report findings and recommendations to client; and use Unix, C and DOS. Reqs. a Masters deg. (or its foreign educ. equiv.)in comp. sci., syst. analy., comp. inf. syst., comp. engg., electrical engg., electronic engg., physics or math., plus 2 yrs. exp. in the job offered. $59,467.20/yr., 40 hrs/wk., M-F, 9a-5p. Send resume along with J.O.N. 1024622 to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila, PA 19123.

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Programmer Analyst (5 openings) (J.O.N. 5551808)- Develop, test and document computer programs; evaluate user requests for new or modified programs; and use Powerbuilder, DB2 and Lotus Notes. Reqs. a bachelors degree in comp. science., Sys. Anal, Comp. Infor. Sys., Comp., Electr. or Electro. Engg, or Math. or its equiv. in edu. and exp. plus one year of exp. in the job offered or related occu. such as Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. The related exp. must have incl. using Powerbuilder DB2 and Lotus Notus. Will also accept 3 years of college edu. plus 3 years exp. on the job offered or related occupation in lieu of the required edu. and exp. 40 hrs pr/wk, M-F, 9-5, Salary $73,000. Send resumes with job order no. 5551808 to: Employment Department, Attn: J.O.N. 5551808, 875 Union Street N.E., Rm 201, Salem OR 97311.

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SOFTWARE ENGINEER: Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Progress, Oracle, Pro*C and Developer/2000. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Progress, Oracle, Pro*C and Developer/2000. Salary: $68,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. John McCraley, Butler County Job Center, 227 West Cunningham Street, Butler, PA 16003, Job No. 9095201.

SOFTWARE ENGINEER: Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Uniface 6.1D, Oracle 7.0, C and Sybase. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Uniface 6.1D, Oracle 7.0, C and Sybase. Salary: $57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. James Clarke, Uniontown Job Center, 32 Iowa Street, Uniontown, PA 15401, Job No. 9095210.

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SOFTWARE ENGINEER: Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in PowerBuilder 5.0, Oracle 7.2 and C. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of PowerBuilder 5.0, Oracle 7.2 and C. Salary: $57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Terry Kinney, Armstrong County Job Center, 1270 N. Water Street, PO Box 759, Kittanning, PA 16201, Job No. 8049033.

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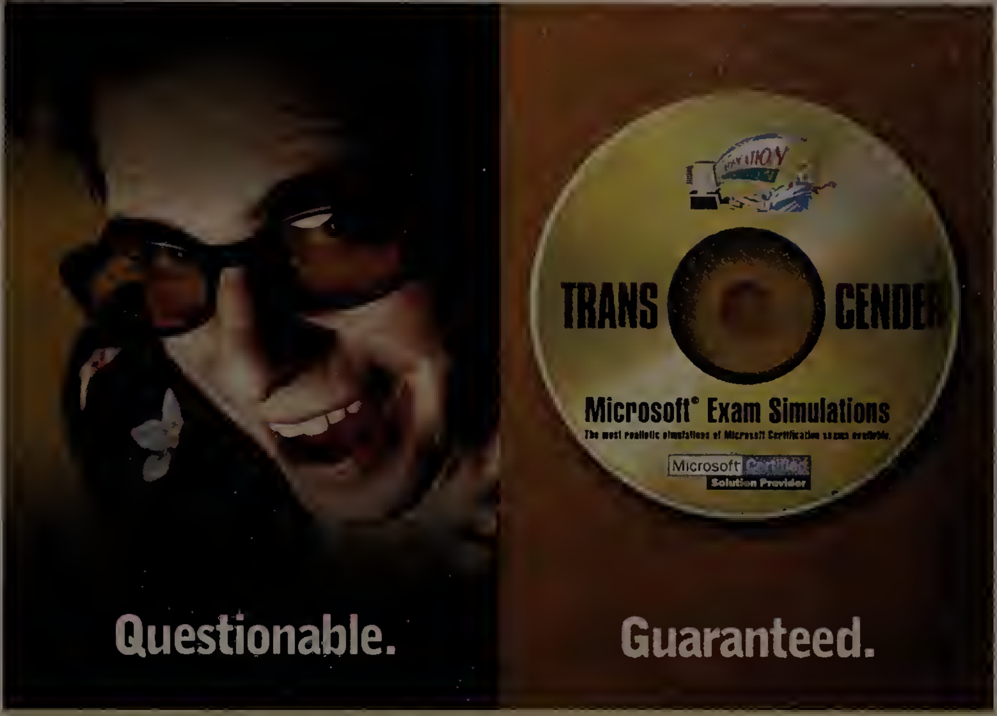
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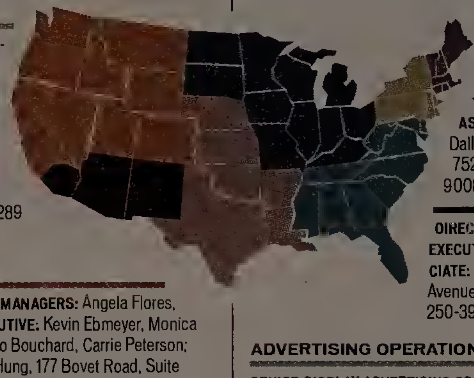

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GAINERS

PERCENT

Qualcomm (H)	29.3
Documentum	28.1
Compuware Corp.	26.5
3Com Corp.	25.9
Businesss Objects S.A.	22.3.
IDX Systems (L)	22.2
Checkpoint Software Tech. Ltd.	20.0
Pixar	18.8

DOLLAR

Qualcomm (H)	43.94
IBM	29.63
Amazon.com	17.31
Excite Inc.	15.19
@home Corp.	9.81
Tellabs Inc. (H)	8.75
Lexmark International Group Nc.	7.88
ETrade Group Inc.	7.13

LOSERS

PERCENT

Cadence Design Systems (L)	-44.3
The Vantive Corp.	-34.0
Avid Technology	-29.1
Network Associates (L)	-22.8
NCR	-19.0
Micron Technology	-19.0
Parametric Technology Corp.	-18.7
Secure Computing Corp. (L)	-17.6

DOLLAR

Cadence Design Systems (L)	-10.13
NCR	-10.13
Micron Technology	-8.69
Veritas Software Corp.	-8.13
Infoseek	-7.63
Yahoo Inc.	-6.44
Uniphase	-6.38
Avid Technology	-6.00

ANALYSTS MAINLY RATE HP A BUY

Stock price inches up as Compaq, others in flux

BY DAVID ORENSTEIN

HEWLETT-PACKARD CO. has been steady on Wall Street even as other PC and server stocks have been more volatile.

During the past three months, HP stock has edged up about 1%, to $71.38 on April 21, while IBM and Dell Computer Corp. have each shed as much as 6% of their value, and Compaq Computer Corp. has dropped off nearly 50%. IBM came back strong Thursday.

With its next earnings report due May 17 and having seen positive earnings surprises during its past two quarters, HP enjoys the moderate confidence of analysts surveyed by Boston-based First Call Corp. Of the 20 analysts surveyed, the average rating is Buy, with five recommending a Strong Buy and seven suggesting the stock be Held.

One of the Strong Buy recommendations comes from the New York investment firm Gruntal & Co. LLC. Concerned by Compaq's warning of disappointing earnings this month, Gruntal said it grilled HP management. In an April 12 report based on that call, Gruntal analysts said they expect orders of HP PCs, servers and peripherals to grow 5% during the second quarter compared with the same period last year. Meanwhile, the company is better able to withstand fierce price competition, the report said, because it cut costs last year.

But HP still has problems to overcome, according to William Milton, an analyst at Brown Brothers Harriman & Co. in New York. After hearing from storage vendor EMC Corp. that HP's orders from the company are down, Milton questioned whether HP's server demand is weakening. He added that although the company will see little new revenue growth from its recent spin-off of its measurement division, it will face higher costs because it can no longer spread its corporate overhead across as big an organization.

INDUSTRY ALMANAC

Milton also said HP may be hurt by a decline in its market share for low-end printers. The company won't be able to focus, he said, until it finds a replacement for departing CEO Lew Platt. ◗

Hewlett-Packard Stays Solid

During the past three months, Hewlett-Packard stock has held its own in a sometimes volatile market

COMPANY	1/22	2/19	3/19	4/22	CHANGE
Hewlett-Packard	69 17/32	68 5/16	70 7/8	76 5/8	+10.2%
Dell Computer Corp.	41 1/2	40 1/16	40 1/4	41	-1.2%
IBM	179 3/4	171 5/8	168 9/16	194 7/8	+8.4%
Compaq	46 3/16	41 1/8	30 3/4	23 11/16	-48.7%

SOFTWARE UP 0.8%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
ADBE	63.75	23.62	Adobe Systems Inc (H)	63.75	4.50	7.6
AZPN	56.87	6.12	Aspen Technology Inc	8.75	0.19	2.2
ADSK	49.43	21.62	Autodesk Inc.	26.56	-1.88	-6.6
AVID	47.75	11.06	Avid Technology	14.63	-6.00	-29.1
BOBJ	42.50	6.12	Businesss Objects S.A	24.38	4.44	22.3
CDN	39.00	10.62	Cadence Design Systems (L)	12.75	-10.13	-44.3
CBTSY	63.87	6.68	CBT Group Plc	13.00	-0.94	-8.7
CHKPF	56.00	10.87	Checkpoint Software Tech Ltd.	36.75	6.13	20.0
CTXS	53.75	23.12	Citrix Systems Inc.	38.00	6.00	18.8
COGNF	28.25	14.75	Cognos Inc.	24.38	0.00	0.0
CA	61.93	26.00	Computer Associates Int'l Inc.	39.75	4.50	12.8
CPWR	40.00	16.37	Compuware Corp	24.50	5.13	26.5
DCTM	59.50	9.37	Documentum	17.38	3.81	28.1
EFII	48.12	13.50	Electronics For Imaging	46.38	0.63	1.4
HNCS	47.12	13.75	Hnc Software	21.25	1.25	6.3
IDXC	55.75	12.43	IDX Systems (L)	15.50	2.81	22.2
IFMX	14.00	3.50	Informix Software Inc	8.06	0.44	5.7
INTU	110.75	34.18	Intuit	93.13	-2.38	-2.5
JKHY	55.00	26.43	Jack Henry Associates	31.75	-2.63	-7.6
JDEC	49.50	10.87	J.D. Edwards & Co.	13.50	1.88	16.1
LGTO	67.75	23.50	Legato Systems Inc.	42.81	5.06	13.4
MACR	50.00	12.31	Macromedia Inc.	40.63	-2.63	-6.1
MANU	63.50	5.25	Manugistics Group Inc.	8.00	0.63	8.5
MENT	15.06	5.43	Mentor Graphics	12.88	-0.19	-1.4
MSFT	95.62	40.93	Microsoft Corp.	86.44	-1.50	-1.7
NETA	67.68	10.06	Network Associates (L)	12.50	-3.69	-22.8
GMH	57.87	30.37	Network General	52.50	-2.56	-4.7
NOVL	28.12	9.28	Novell Inc.	24.00	1.38	6.1
ORCL	41.18	12.25	Oracle Corp.	26.81	2.06	8.3
PMTC	36.31	8.50	Parametric Technology Corp.	13.06	-3.00	-18.7
PSFT	53.50	11.50	PeopleSoft Inc. (L)	13.13	0.13	1.0
PIXR	66.00	27.50	Pixar	43.75	6.94	18.8
PLAT	34.31	9.00	Platinum Technology Inc.	25.13	0.50	2.0
RATL	35.62	10.50	Rational Software Corp.	31.06	0.69	2.3
SAP	60.12	23.75	SAP AG	29.13	3.13	12.0
SCUR	29.00	3.75	Secure Computing Corp. (L)	3.94	-0.84	-17.6
SE	48.75	20.12	Sterling Commerce Inc.	30.13	0.56	1.9
SSW	32.81	18.56	Sterling Software Inc. (L)	20.13	0.56	2.9
SDRC	29.00	7.50	Structural Dynamics Research	18.94	-0.31	-1.6
SYBS	11.62	4.50	Sybase Inc.	8.56	-0.81	-8.7
SYMC	32.62	8.68	Symantec Corp.	19.25	1.72	9.8
SNPS	61.25	24.50	Synopsis	45.75	0.75	1.7
SCTC	30.87	7.81	Systems & Computer Technology	12.38	-0.38	-2.9
BAANF	50.12	8.87	The Baan Co. N.V.	8.88	0.88	10.9
VNTV	37.37	5.00	The Vantive Corp.	6.44	-3.31	-34.0
TSAI	51.00	27.06	Trans. Sys. Arch	30.25	-5.50	-15.4
VRTS	90.12	23.75	Veritas Software Corp.	73.88	-8.13	-9.9
WIND	34.43	11.25	Wind River Systems Inc.	12.75	-1.50	-10.5

TELECOMMUNICATIONS CARRIERS UP 5.0%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
ATI	102.68	42.25	Airtouch Communications	96.69	2.88	3.1
AT	72.43	38.25	Alltel Corp. (H)	70.88	-0.44	-0.6
AIT	69.37	41.50	Ameritech Corp.	68.00	4.88	7.7
ANDW	24.06	10.37	Andrew Corp.	14.50	1.44	11.0
T	64.12	32.25	AT&T	53.06	-3.38	-6.0
BCE	51.06	25.62	BCE, Inc.	49.00	1.00	2.1
BEL	61.18	40.43	Bell Atlantic	58.88	0.75	1.3
BLS	50.00	31.06	Bell South	44.50	3.31	8.0
CSN	23.43	8.50	Cincinnati Bell Inc.	22.13	1.75	8.6
CMCSK	78.43	32.62	Comcast	68.75	3.81	5.9
CQ	42.75	21.75	Comsat Corp.	31.38	0.50	1.6
COX	82.56	41.50	Cox Communications Inc	75.00	5.19	7.4
GSTRF	36.12	8.31	Globalstar Telecom. Ltd.	20.00	0.06	0.3
GTE	71.81	46.56	GTE Corp.	66.88	0.00	0.0
NXTL	42.50	15.37	Nextel Communications	38.75	0.38	1.0
SPOT	64.00	26.37	Panamsat	30.56	2.00	7.0
QCOM	198.50	37.75	Qualcomm (H)	193.69	43.94	29.3
SBC	59.93	35.00	SBC Communications	55.38	3.69	7.1
FON	114.62	54.43	Sprint Corp.	106.88	6.75	6.7
TDS	60.38	30.62	Telephone and Data Systems (H)	60.38	0.56	0.9
USW	66.00	46.81	US West	55.63	1.06	1.9
VIA	48.75	24.62	Viacom	44.81	4.38	10.8
WCII	54.62	10.25	Winstar Communications Inc.	46.69	0.31	0.7
WCOM	94.25	39.00	MCI Worldcom Inc.	90.69	4.06	4.7

SERVICES UP 3.3%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
ACXM	31.25	16.50	Acxiom Corp.	25.50	0.31	1.2
ACS	51.75	22.37	Affiliated Computer Servs	40.25	-2.63	-6.1
AMSY	40.25	19.25	American Mgt. Systems	32.63	3.63	12.5
AUD	44.69	30.81	Automatic Data Processing (H)	44.69	4.25	10.5
BSYS	59.37	35.25	Bisys Group, Inc.	56.25	0.38	0.7
CATP	58.37	10.62	Cambridge Technology Ptnrs	13.63	-0.50	-3.5
CEN	40.50	24.00	Ceridian	36.00	1.19	3.4
CBR	40.87	13.31	Ciber Inc.	19.31	0.75	4.0
CDO	30.87	10.75	Comdisco	25.88	2.00	8.4
CHRZ	46.50	9.25	Computer Horizons Corp	13.06	0.25	2.0
CSC	74.87	46.25	Computer Sciences	54.94	-2.81	-4.9
DST	70.56	34.00	Dst Systems Inc.	62.81	2.25	3.7
EDS	54.31	30.43	Electronic Data Systems (H)	53.56	3.06	6.1
FDC	46.25	19.68	First Data Group (H)	44.69	3.69	9.0
FISV	56.37	36.75	Fiserv	54.00	-0.13	-0.2
IT	35.62	17.31	Gartner Group	19.31	-1.25	6.1
KEA	60.93	17.25	Keane	22.63	3.25	16.8
NDC	55.25	26.18	National Data	44.63	2.50	5.9
PAYX	55.06	33.12	Paychex, Inc	52.75	1.41	2.7
REGI	26.50	4.00	Renaissance Worldwide	5.84	0.66	12.7
REY	23.31	12.62	Reynolds & Reynolds	21.19	2.63	14.1
SFE	120.00	17.12	Safegard Scientifics	88.31	2.75	3.2
SAPE	82.87	24.25	Sapient Corp	60.00	0.25	0.4
SMS	86.50	40.06	Shared Medical Systems	57.25	0.50	0.9
SDS	41.93	21.68	Sungard Data Systems	33.06	0.94	2.9
SYNT	32.62	8.68	Syntel Inc.	19.25	1.72	9.8
TECD	53.12	14.50	Tech Data	23.31	0.31	1.4
TSS	26.25	14.43	Total System Services, Inc	19.69	-0.06	-0.3
TSAI	51.00	27.06	Transaction Sys. Architects	30.25	-5.50	-15.4

NETWORK UP 1.2%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
COMS	51.12	20.00	3Com Corp	26.13	5.38	25.9
ADCT	52.25	15.75	ADC Telecommunications Inc	46.50	2.38	5.4
ANTC	29.68	11.50	Antec	24.88	2.31	10.2
ASND	102.56	32.62	Ascend Communications Inc	96.94	7.06	7.9
BNYN	19.37	2.12	Banyan Systems Inc	14.50	-1.13	7.2
CS	15.31	6.62	Cabletron Systems	8.38	1.13	15.5
CNEBF	20.00	5.75	Call-Net Enterprises	7.06	1.19	14.4
CSCO	120.00	41.12	Cisco Systems Inc	114.44	5.88	5.4
ECILF	45.00	19.75	ECI Telecom	39.25	-1.00	2.5
FORE	28.00	9.25	Fore Systems Inc.	24.63	0.00	0.0
HRS	53.00	27.31	Harris Corp	33.69	-0.75	-2.2
GMH	57.87	30.37	Hughes Electronics/GM	52.50	-2.56	-4.7
ERICY	34.00	15.00	LM Ericsson	25.78	0.47	1.9
LU	67.00	26.68	Lucent Technologies	61.13	3.94	6.9
MADGF	7.75	1.75	Madge Networks	2.44	-0.31	-11.4
NCDI	10.00	4.37	Network Computing Dev	5.00	-0.44	8.0
NWK	20.82	7.31	Network Equipment Tech	7.81	0.06	0.8
NN	39.87	15.43	Newbridge Networks	35.31	1.38	3.7
NOK	85.68	29.50	Nokia Corp	79.88	2.81	3.6
NT	76.25	26.81	Northern Telecom Ltd	71.88	2.00	2.9
PAIR	20.37	6.00	Pairgain Technologies Inc	12.31	1.13	10.1
PCTL	11.93	4.31	Picturetel	7.50	0.69	8.4
SFA	35.00	11.75	Scientific Atlanta	28.31	-0.50	1.7
TLAB	117.75	31.37	Tellabs Inc (H)	113.56	8.75	8.3
USW	66.00	46.81	US West	55.63	1.06	1.9
VRLK	9.65	2.12	Verilink	3.44	0.19	5.8
WSTL	12.25	2.75	Westell Technology Inc	6.06	1.00	14.2
XYLN	37.00	9.62	Xylan	36.94	0.06	0.2

SEMICONDUCTORS, CHIPS & EQUIPMENT UP 1.0%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
ADPT	26.75	7.87	Adaptec	21.81	1.44	6.2
AMD	33.00	9.31	Advanced Micro Devices	17.19	0.81	5.0
ALTR	81.00	28.25	Altera (H)	81.00	6.50	8.7
ADI	39.62	12.00	Analog Devices	36.88	1.31	3.7
AMAT	71.62	21.56	Applied Materials	61.63	-0.38	-0.6
ASML	50.37	12.93	ASM Lithography Holding	47.13	1.44	3.1
HRS	53.00	27.31	Harris Corp	33.69	0.75	2.2
INTC	71.87	32.87	Intel Corp	62.81	5.25	9.1
KLAC	65.00	20.75	Kla Instruments	56.19	1.38	2.5
LLTC	63.50	19.56	Linear Technology	62.13	0.38	0.6
LSI	38.31	10.50	LSI Logic	35.31	-1.00	2.8
MXIM	64.75	22.31	Maxim Integrated Products (H)	63.25	2.38	3.9
MU	80.56	20.06	Micron Technology	37.13	-8.69	-19.0
MOT	86.00	38.37	Motorola	80.88	0.19	0.2
NSM	24.18	7.43	National Semiconductor	13.00	1.25	10.6
STM	121.68	35.87	SGS-Thomson Microelectronics	110.50	-2.50	-2.2
SLR	56.25	17.68	Solectron Corp.	50.31	0.25	0.5
TER	66.50	15.00	Teradyne	56.81	2.31	4.2
TXN	114.87	45.37	Texas Instruments	108.50	0.81	0.8
UNPH	136.00	31.25	Uniphase	121.25	-6.38	5.0
VTSS	59.00	17.12	Vitesse Semiconductor Corp	50.88	4.00	8.5
XLNX	54.37	14.87	Xilinx (H)	48.00	-1.00	2.0

COMPUTER SYSTEMS UP 1.5%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
AAPL	47.31	25.62	Apple Computer Inc.	38.09	2.59	7.3
ASPX	12.50	1.62	Auspex Systems	8.50	0.50	-5.6
CPQ	51.25	22.56	Compaq (L)	23.25	-0.25	1.1
DGN	21.81	7.00	Data General	10.88	0.13	1.1
DELL	55.00	18.12	Dell Computer Corp	42.81	3.63	9.3
GTW	84.50	36.12	Gateway 2000 Inc	68.63	4.50	7.0
HWP	83.87	47.06	Hewlett-Packard Co.	77.31	7.00	10.0
HIT	78.93	40.18	Hitachi Ltd	71.63	-1.94	-2.6
IBM	202.06	106.00	IBM	202.06	29.63	17.2
MUEI	24.75	9.37	Micron (L)	10.56	0.38	3.7
MOT	86.00	38.37	Motorola	80.88	0.19	0.2
NATI	36.37	17.50	National Instruments Corp.	28.50	0.25	0.9
NCR	55.75	23.50	NCR	43.06	-10.13	-19.0
NIPNY	60.50	31.00	NEC	57.38	1.38	2.5
PRCM	13.25	3.50	Procom Tech Inc	4.38	0.06	1.4
SQNT	20.25	5.68	Sequent Computer Systems	8.75	-0.19	-2.1
SGI	20.87	7.37	Silicon Grafix	13.00	0.19	1.5
SNE	104.31	60.25	Sony	96.25	-3.44	-3.4
SUNW	72.50	19.18	Sun Microsystems	62.75	6.63	11.8
TEXM	5.93	2.00	Texas Micro	4.63	0.00	0.0
TRCD	4.87	0.37	Tricord Systems	2.25	-0.13	-5.3
UIS	36.37	17.62	Unisys	30.13	0.44	1.5

INTERNET OFF -0.6%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
AMZN	207.56	12.87	Amazon.com	207.56	17.31	9.1
AOL	175.50	17.25	America Online	146.00	-0.50	-0.3
ATHM	198.00	23.50	@home Corp	157.88	9.81	6.6
CKFR	69.12	5.75	Checkfree	47.50	-3.13	-6.2
CYCH	24.87	5.87	Cybercash, Inc.	17.94	-1.00	-5.3
EDFY	15.00	3.81	Edify Corp.	7.94	-0.31	-3.8
EGRP	144.50	5.00	ETrade Group Inc.	102.38	7.13	7.5
XCIT	187.87	18.00	Excite, Inc	154.88	15.19	10.9
SEEK	100.00	14.87	Infoseek	57.50	-7.63	-11.7
LCOS	145.37	20.06	Lycos, Inc.	95.00	0.56	0.6
OMKT	27.00	4.25	Open Market, Inc.	13.94	-1.25	-8.2
OTEX	42.50	10.00	Open Text Corp	34.50	-1.63	-4.5
PSIX	73.75	8.37	PSINet Inc.	60.00	2.31	4.0
SDTI	30.62	5.43	Security Dynamics	19.44	0.69	3.7
SPYG	32.25	8.62	Spyglass Inc.	15.31	1.31	7.9
YHOO	244.00	24.87	Yahoo Inc.	186.75	6.44	-3.3

STORAGE & PERIPHERALS UP 0.6%

EXCH	52-WEEK RANGE			APRIL 23 2 PM	WK NET CHANGE	WK PCT CHANGE
ADPT	26.75	7.87	Adaptec Inc.	21.81	-1.44	-6.2
APCC	55.50	26.18	American Power Conversion	34.00	3.63	11.9
CANNY	25.93	17.00	Canon Inc	24.75	0.75	3.1
DBD	44.06	19.12	Diebold Inc.	23.56	-1.63	-6.5
EK	88.93	60.81	Eastman Kodak Co.	74.31	1.00	1.4
EMC	135.00	40.18	EMC	109.13	0.44	0.4
IOM	10.18	2.93	Iomega	5.00	-0.13	-2.4
LXK	120.62	50.75	Lexmark International Group, Nc.	118.13	7.88	7.1
QNTM	29.93	10.81	Quantum	18.56	0.28	1.5
SEG	44.25	16.12	Seagate Technology	28.44	0.50	1.8
STK	51.12	17.50	Storage Technology	17.81	-1.81	9.2
TEK	43.68	13.68	Tektronix	25.56	-0.19	0.7
XRX	63.00	39.00	Xerox	57.94	2.94	5.3

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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Users Like Win 2000 Beta Bundle on PCs and Laptops

BY STACY COLLETT

Why would Windows 2000 wanna-be users pay for a sneak preview of the long-awaited operating system when they could get it for free in Microsoft's beta-testing program? The answer, they say, is the packaging.

Dell Computer Corp., Compaq Computer Corp. and 20 other vendors will sell desktop and laptop PCs bundled with Windows 2000 Beta 3. Microsoft Corp. Chairman Bill Gates said he expects 400,000 people will buy Microsoft's Corporate Preview Program, and eager users are already lining up. Beta 3 is expected to ship early next month.

"This is a clever way [to bypass] all the problems of setting up a new machine or taking an existing machine and loading Windows 2000 Beta 3. [Users] could save some time and possibly some headaches," said Bill Cornfield, president of The Windows Support Group Inc., a software developer in New York.

"We need a good directory services platform," said Bruce Henson, technology architect for San Bernardino County, Calif. "Windows 2000 with Active Directory is the direction we'll be ultimately going to a couple years down the road. But we need a solution now. So we'll be looking at the beta as a platform to evaluate."

Customers who buy Dell PCs must license NT 4.0 software for $799 to get Beta 3 installed for an additional $100. Future Beta 3 upgrades are included. Users will be able to boot up in either environment and can troubleshoot and compare how their applications run on both operating systems, said Charlie Neet, operating systems product manager at Round Rock, Texas-based Dell.

Microsoft hasn't disclosed Windows 2000's price. The software vendor won't put a ship date on the final release but confirmed that it has an in-house target goal of Oct. 6. ◗

MOREONLINE

For Windows 2000 links, visit our Web site. **www.computerworld.com/more**

Continued from page 1

Win 2000 Beta Offers Limited Migration Aid

gram — said they haven't seen any changes in terms of migration tools in Beta 3. The Rapid Deployment Program is made up of a 20- to 30-member group of vendors and corporate users who are testing the software and are planning to go live with it before the final version ships.

When pressed about the promised slate of new tools and beefed-up utilities, Beilinson last week told *Computerworld* that most of the improvements to date are aimed at software vendors and not corporate users. "If Beta 3 goes out the door and customers tell us the upgrade process still needs work, we'll address it at that time," he said.

That probably will be an issue, according to figures from International Data Corp. (IDC) in Framingham, Mass. There are 160 million installations of Windows 95 and Windows 3.x, which are on more than five times as many desktops (corporate and consumer) as Windows 98 and Windows NT 4.0 Workstation combined.

IDC analyst Dan Kusnetzky said more hardware support and ported applications will help, but they're not the migration tools Microsoft promised. "It's still not quite what people asked for," he said.

Another analyst, who is under a nondisclosure agreement and so asked not to be named, said in a briefing last week that Microsoft Windows 2000 team leader Jim Allchin said the company is pushing to build migration tools into the final release of Windows 2000.

"Allchin seemed aware of the problem it poses for users and aware of the fact that if the migration is very difficult, it could keep people from making the move" any time soon, the analyst said.

George Lioudis, vice president of systems administration at Prudential Insurance Company of America in Livingston, N.J., said he's confident he will get the tools he needs from Microsoft. "My sense is they are going to deliver something useful. It hasn't been their strength in the past, and they've heard that they need to make this easier," he said.

Laptop Support

Although a slate of new or beefed-up tools isn't part of Beta 3, Microsoft's Beilinson pointed to other improvements. He said Microsoft has gone from supporting five laptop models in Beta 2 to supporting more than 120 in Beta 3. "Users will see a much smoother upgrade from that perspective," he said.

Beilinson also noted that Microsoft is working with several hundred software vendors that have agreed to port their applications to the Windows 2000 platform.

The list, which is on Microsoft's Web site, includes Seagate Software Inc. and Platinum Software Corp. but not heavy-hitters like Oracle Corp. and SAP AG. IBM has announced that it's porting its applications to Windows 2000, but it isn't on Microsoft's list.

Beilinson also said Microsoft has made a piece of the installation process — which tells the administrator which parts of the system will be compatible and which parts won't — into a stand-alone tool. ◗

MORE THIS ISSUE

For more coverage on Windows 2000, **see page 80.**

Moving Tools

Some tools and services to help IT managers move from Windows NT 4.0 to Windows 2000:

SERVICE/PRODUCT/VENDOR	FUNCTION
OnePoint Domain Administrator Mission Critical Software Inc.	Enables automatic migration of files to the new directory
Rapid Deployment Kit Fastlane Technologies Inc.	Consolidates domains and migrates users while maintaining operational NT 4.0 backup
Migration services International Network Services	Help IT shops plan, design and deploy the migration

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Continued from page 1

Oracle Support

so it has a chance of being put through to Oracle's Australian support center, where the workers seem more experienced.

Some of the more established product support groups at Oracle do a good job, Nasmyth added. But with newer applications, the phone support "is almost worthless. You have to get past the first and second levels of support and get to the people who actually worked on the product."

Other users said they routinely escalate calls up the chain to support managers — an approach that Oracle executives recommended should be followed when problems aren't getting resolved.

The changes being made by Oracle, which were outlined during some of the conference sessions, include organizational moves and the release of new support-related technology (see chart, page 1). In addition, Oracle's development group is working to improve both its testing and documentation of software patches.

But the company didn't promise a quick fix. Noticeable improvements are expected within six months, but it will likely take a year to get applications support to the same quality level that Oracle has on the database side, said Randy Baker, the company's senior vice president of support.

One of the big challenges, Baker said, is simply hiring enough support workers to keep up with demand. "It's a fast-growing environment, and we've been trying to catch up with it for several quarters," he said.

That has left some users waiting on hold for support help for 20 minutes or more. Users also complained that Windows NT support is especially lacking and that it can take more than a month to get bug fixes for problems that force companies to do manual work-arounds but aren't deemed serious by Oracle.

One user, who asked not to be identified, said Oracle sent out a support worker free of charge for three weeks to help get some problems resolved. "But we spent our whole time training him," the user said. "We were telling him about Oracle systems."

Jeremy Young, a business process manager at DHL Worldwide Express and president of the Oracle Applications Users Group, said support and bug-patching issues were the top priorities cited by members of the user group in its annual objectives survey this year and last.

"But I think Oracle is working very hard to fix this," Young said. "Certainly, the will is there."

Susan Stoll, end-user services manager at The Valspar Corp., said support was the top concern among co-workers she polled at the Minneapolis paint maker before heading to San Diego.

But Oracle's plan to address the problems at least sounds promising, Stoll said. "I think they'll do a better job because they have to. They know this is always going to be a thorn in our side." ◗

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FRANKLY SPEAKING/FRANK HAYES

Such a deal

"SHARKY, OLD PAL, you gotta help me," Murchnick said. "We need new laptops. From Dell. Right now." Sharky carefully finished filling his coffee mug and began spooning in sugar. "Hi ya, Murch. Nice to see you, too. Wife and kids are great. Want to buy some candy bars to help out the soccer team?" he said. "OK, now the pleasantries are out of the way. What are you talking about?"

"Windows 2000," Murchnick said, pulling a crumpled page from inside his jacket and smoothing it flat on the counter. "We can get it four months early. That would give us a big jump on everybody else."

Sharky glanced at the news story. "I heard about that," he said. "Who is it, Dell and IBM and HP and Micron? They're putting the Windows 2000 beta on some of their laptops as an option?"

"Yeah, great, isn't it?" Murchnick said. "If we order it now, we can have it by June at a cheap price. And Windows 2000 won't ship until October — maybe not even then."

"Oh yeah, great," Sharky echoed. He took a sip of the coffee and grimaced. "This just gets worse and worse. Look, Murch, have you talked to the old man?"

"He told me to talk to you," Murchnick said. "I need some real technical firepower . . ."

"He gave you the brush-off, huh?" Sharky said, and thought: *Because he's up to his ears in Y2K, and he doesn't have much "technical firepower" himself, and he doesn't like to admit it.*

Sharky sighed. "OK. Item one: Windows 2000 is a dot-zero product, and practically all the code is new, so it's guaranteed buggy. Remember the last time you talked us into a dot-zero release?"

Murchnick made a face. "But they've been testing this for a year," he said.

"A year and a half, and they're *still* testing it," Sharky said. "Item two: This isn't even a dot-zero release — it's a *beta* for a dot-zero release. Even Microsoft says it's not ready for prime time. You guys want to get work done? Or just play guinea pigs?

"Item three: that cheap price. Sixty bucks for the beta, and you get a free upgrade to dot-zero, right?" Sharky said. "What a deal — we save a couple hundred bucks on something we don't want in the first place. Gee, how much could we save by waiting until it's good enough for Microsoft to call it a product?"

"I thought you guys were big on using IT to get a leg up on our competition," Murchnick grumbled.

"From an operating system? What's the big productivity improvement? They leave out solitaire?" Sharky asked. "Item four: The *last* beta broke half of those old DOS and Windows utilities you guys can't live without. Item five: You aren't scheduled for new laptops for another year."

> *Well, why not wait until Microsoft is willing to call it a product?*

"Did I miss anything?" Sharky said. "I'm out of fingers."

Murchnick frowned. "So you're not going to back me up on this thing?"

"Look, Murch," Sharky said, "I like the way you're thinking, but I'm flat out, and I'm down a half-dozen bodies. I'm not pitching the boss anything ending in '2000' until January, maybe February." He sipped more coffee. "Good to talk to you, but . . ."

"OK then," said Murchnick, reaching inside his jacket for another sheet of paper. "What about this Linux?"

Sharky edged away slowly. "How many pockets you got there, Murch?"

"It's supposed to be great stuff, and all the software is free."

"Gotta get back to work, Murch."

"And this columnist," Murchnick read off the clipping, "says now it's as easy to use as Windows. Sharky?" Murchnick looked up. "Sharky? Where'd that guy go?" ▸

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

JUST AS I SUSPECTED. We just heard from Jim Kinney, CIO at Kraft Foods and one of the six CIOs at Philip Morris. Get this: Three of 'em have no IT background at all, and Kinney says that until a little while ago, he was the only IT career guy in the bunch. No wonder we have to speak . . . very . . . slowly.

A BUNCH OF INDUSTRY GROUPS last year begged Washington for Y2K help and got the Y2K Information Readiness Disclosure Act. The idea was we'd all swap Y2K info with our bitter competitors, for the greater good – without risk of antitrust lawsuits. Right. A pilot fish informs Sharky that disclosures *did not* increase, cooperation *did not* improve, and Y2K jefe John Koskinen recently *did* meet with more trade groups to beg . . . er, encourage them to make nice.

CLUES NEEDED INSIDE THE BELTWAY. Commerce Department officials looking for info on the IT labor drought have been sniffing around IT staffing conferences lately. Who are they asking? Us IT nobodies who are so shorthanded we're catching help desk calls ourselves? Nah – they're asking analysts and reporters. Also, the SEC slapped a $5,000 fine on Allegheny Financial Programs, a one-man mutual-funds outfit in Clarksburg, W.Va., for not filling out a 17-page, Y2K compliance form. Allegheny doesn't have any computers.

NICE POINTER. Richard Rist, an analyst at the Data Warehousing Institute in Gaithersburg, Md., has a nice rule of thumb for vendor diagrams: "Every time you see an arrow, put your name there. . . . That arrow means you – not the vendor – have to do something."

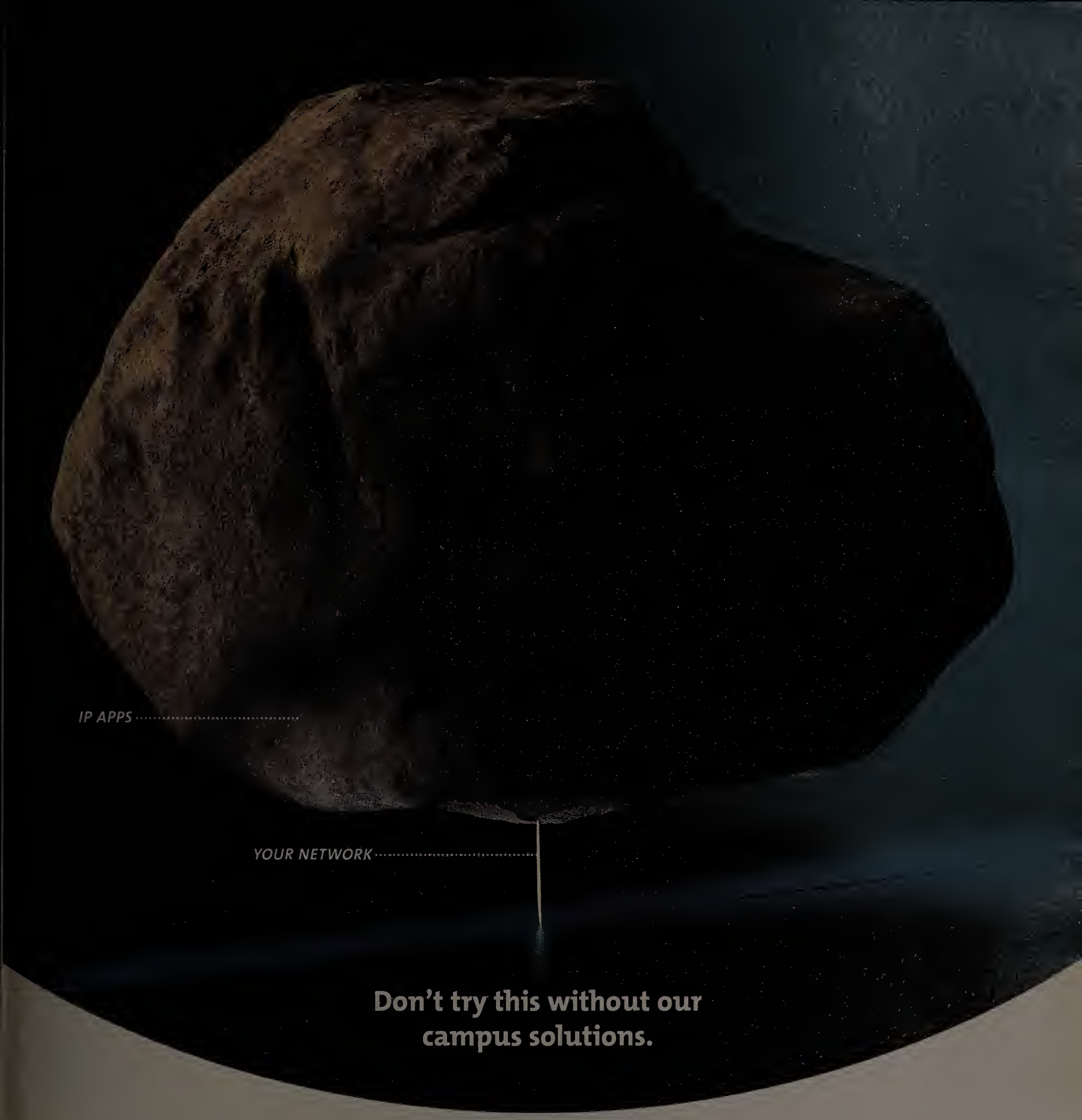
ATTENTION: This year, Memorial Day will be May 24, not May 31 as previously scheduled – at least according to Microsoft Outlook 98. (Office 2000 thinks so, too, according to a Friend of Sharky's in Redmond.) Please change your desk calendar, your cookout plans and the Indy 500 accordingly. That is all.

Messing with long weekends is a good way to get your hand bitten off here in the Tank. If you want to nip anybody – vendor, CIO, overpriced consultant – fire off an e-mail to **sharky@computerworld.com.** Your identity will remain top secret.

The 5th Wave

"Please, Dad – do we have to hear the story of Snow White's OSI model and its 7 layers again?"

E-Mail Rich Tennant at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YOUR NETWORK
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Let's face it, with network traffic doubling every 12 to 18 months and Intranet services requiring more and more bandwidth, if your network doesn't adapt, it'll be squashed. Don't let that happen. Our Accelar* campus solutions deliver the versatility and reliability required to manage the convergence transition seamlessly. And set the stage for a unified telephony and data network with an evolution management platform. So don't try this with anyone but us. Come together with Accelar. **www.nortelnetworks.com/3YGT**

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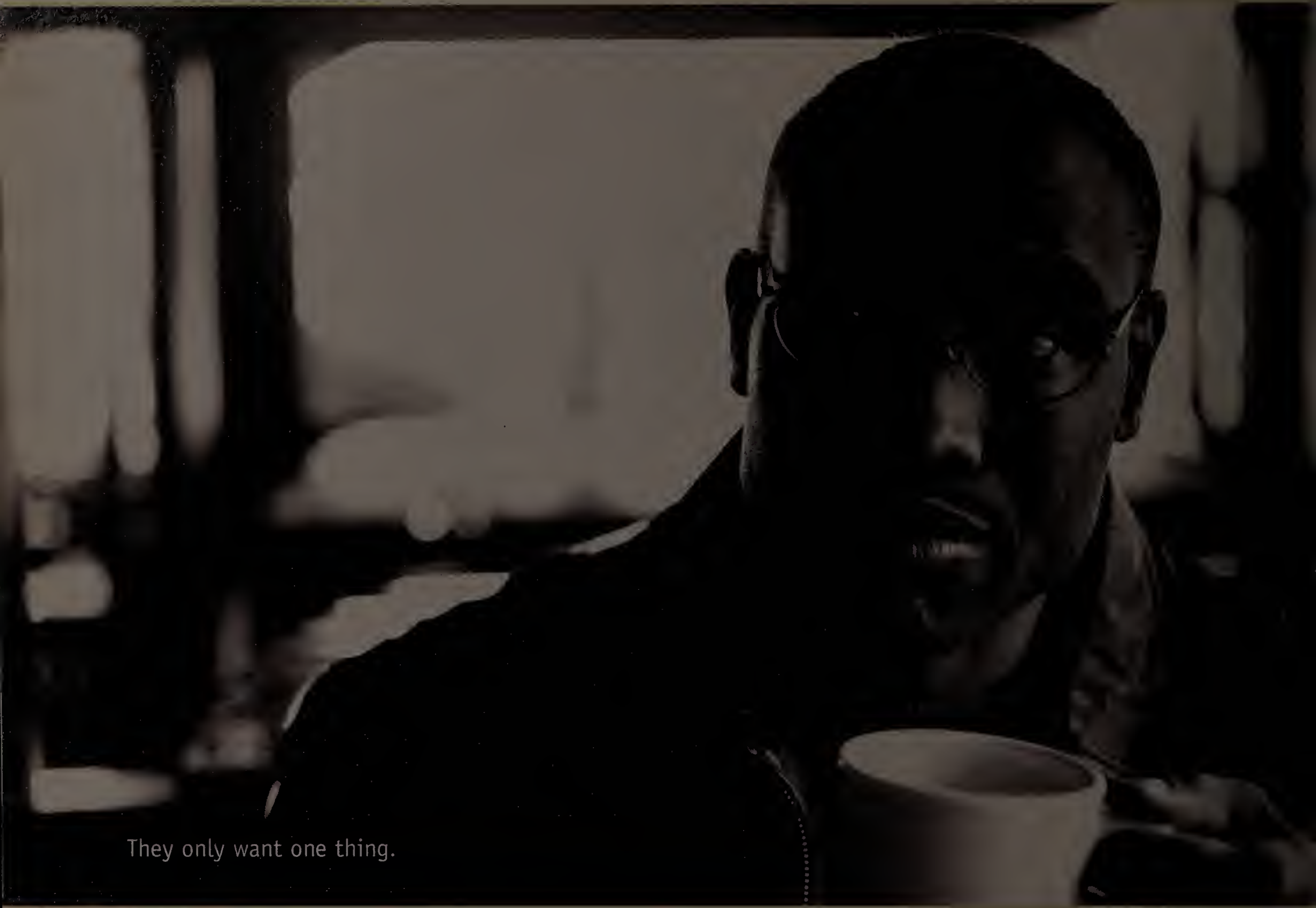
Are you ready for the new customer?


They only want one thing.

They want your product information, sales staff, service plans, tech help, partners and prices all to fit on their computer screen.

E-customers are a demanding bunch. They don't want to hunt for information. They don't want to search for convenience. They want it here and now. And that's why they're taking a hard look at the companies they deal with. Can they get 24/7 access? Can they get up-to-date, consolidated information from a single source? Can they get it delivered in a personalized format? For many companies, those are tough questions—integrating their customer relationship management systems with their web site is asking a lot. This is where Vantive clicks in.

A leader in customer-facing applications since 1990, Vantive's high-performance architecture gives customers a 360 degree view of your company. In turn, it gives you a complete picture of the customer—with powerful agent solutions. By extending your enterprise to the web, Vantive helps you manage the customer lifecycle. So no matter how they interact with you (web, phone, fax or in-person), you can meet their needs—from buying to support. It's the kind of integration companies like yours have been wrestling with. And the kind of service e-customers demand.
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